LOUGH ERNE AND SHANNON.——SHANNON NAVIGATION.

RETURN to Two Orders of the Honourable The House of Commons,
dated respectively 7 & 30 July 1845;—*for*,

COPIES "of all Memorials, Correspondence, Surveys, Valuations, and Reports, in relation to the Extension of Canal or River Navigation between Lough Erne and The River Shannon."

(Mr. Morgan John O'Connell.)

RETURN "of Payment on account of Commission for Improvement of the River Shannon, and for Works under their Direction, whether by Grant or Loan (*in continuation of Parliamentary Paper, No.* 459, *of Session* 1844):"

"Similar RETURN of the Amount and Periods of Payment for Works; from what Quarter issued; whether by Grant or Loan; also, of the Amount, whether by Grant or Loan, that the Treasury have still to pay in Advance for the same Works."

(Colonel Sibthorp.)

Ordered, by The House of Commons, *to be Printed,*
8 *August* 1845.

633.

Under 8 *oz.*

SCHEDULE.

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COPIES of all Memorials, Correspondence, Surveys, Valuations, and Reports, in relation to the Extension of Canal or River Navigation between Lough Erne and The River Shannon.

LETTER from *Henry Porter*, Esq. Secretary of the Ulster Canal Company, to *Henry R. Paine*, Esq.

Letter from Henry Porter, Esq. to Henry R. Paine, Esq. 3 August 1844.

Ulster Canal Office, Austin Friars,
London, 3 August 1844.

Sir,

The Directors of the Ulster Canal Company being deeply impressed with the importance of extending their navigation between Lough Erne and the River Shannon, in connexion with the works now in progress for the improvement of the Woodford River, have desired me respectfully to request to be furnished with an estimate of the probable expense of surveys, sufficient for the purpose of the Company, of the navigation of that river.

The Directors will feel grateful to your Board, if, as the object is one of such great importance, you will favour them with any information in your power relating to the line of navigation between Lough Erne and the Shannon, and especially with your views as to the best point of junction with the latter.

As the directors have reason to believe that your Board are in possession of estimates of the probable cost of making the navigation complete between Lough Erne and the Shannon, the directors will feel themselves further obliged if you will favour them with the result of such estimates.

I have, &c.
(signed) *Henry Porter*, Secretary.

LETTER from *Henry R. Paine*, Esq. in Reply thereto.

Letter from Henry R. Paine, Esq. 12 August 1844.

Sir, Office of Public Works, 12 August 1844.

The Commissioners have had before them your letter of the 3d instant, requesting, by desire of the Ulster Canal Company, to be furnished with a statement of the expense that would be requisite for surveys, &c. for a project to connect Lough Erne and the Shannon, in connexion with the improvements to be made by this Board, in Woodford River, for the Ballinamore drainage; and also to have the opinion of the Commissioners as to the best point at which a canal from the lake might join the river.

No works are yet in progress by the Board on the Woodford River, but the Commissioners have received a memorial, under the provisions of the Drainage Act, 5 & 6 Vict. c. 89, and a deposit of funds for the detailed surveys, estimates, and preliminary proceedings required for the drainage of lands along the river from Ballinamore, nearly to Lough Erne.

The river extends beyond Ballinamore to Lough Scur, on the summit of the country, within five statute miles of the Shannon, at Leitrim, to which a small stream flows directly from the summit referred to. As yet the Commissioners have not received any application for the drainage of the lands along this portion of the line, but they are led to understand that the proprietors of this district contemplate doing so. It is right that the Ulster Canal Company shall be aware of the circumstances, and that any application to this Board should be made under the provisions, and subject to the conditions of the Drainage Act, which gives all the requisite powers, upon the application, and at the expense either of the counties benefited, or any person or company, for the formation or improvement of navigation in conjunction with drainage, and for the subsequent maintenance of the navigation so made, and allocation of the tolls, &c.

With reference to the probable expense of the surveys and other preliminary proceedings, under the Act, respecting the navigation part of the inquiry, it is, under the foregoing circumstances, difficult to form an estimate; the most economical course for all parties would be, that the surveys and inquiries, both as to the navigation and drainage, should be effected, in their full detail, together; and this can of course be done if the parties interested in the navigation now forward their memorial, under the Act, and the necessary funds.

In conjunction with the complete drainage inquiry a sum of 350 *l.* would probably be sufficient for the detailed surveys and preliminary proceedings regarding the navigation from Lough Erne to the Shannon at Leitrim. If not aided by the two inquiries, the expense would, of course, be greater.

The chief information as to this project possessed by the Board, is that contained in Mr. Mulvany's report on this subject, presented to Parliament in 1839, from which and from any subsequent information the Board have obtained, it appears that Leitrim, which will be the terminus of the steam navigation of the Shannon, is the best point of junction with that river. It also appears from a recent cursory examination of the country, for the purposes of the drainage measures along the Woodford River, that by combining the objects of drainage and navigation, and making available (by connecting them) the several small lakes and navigable portions of the Woodford River, believed to be nearly 19 miles in length in the aggregate, a very great saving may be effected in the cost of the navigation part of the measure, when compared with the estimate for an artificial canal for the whole distance, as stated in the report referred to, perhaps even from 153,000 *l.* to 80,000 *l.*; but the Commissioners are not in possession of any precise estimate on the subject, no survey for the purpose having yet been made.

I have, &c.
(signed) *Henry R. Paine.*

LETTER to Lord *Eliot* from Sir *John Burgoyne*.

Letter to Lord Eliot from Sir John Burgoyne, 12 August 1844.

Office of Public Works,
12 August 1844.

Dear Lord Eliot,

I RETURN the printed paper on the project for uniting the navigations of Lough Erne and the Shannon, and thereby nearly all other navigations of Ireland, presented to you by Mr. Pierce Mahoney.

The importance of such an undertaking can scarcely be over-estimated, and will be more clearly explained by a report drawn up by Mr. Mulvany in 1839, of which I enclose a copy. It would, in fact, afford outlets from the Shannon and surrounding districts direct to two new ports, viz. Belfast and Newry.

Since that report was made, measures of drainage are in contemplation under the new Drainage Act, which, if carried out, would very greatly facilitate the effecting of a navigation, by adapting the works (without increasing the cost to the parties seeking the drainage) so as best to meet both objects.

So great an effect will be produced, that Mr. Mulvany's estimate for the navigation will be reduced from 153,000 *l.* to perhaps not much exceeding 80,000 *l.*

The alteration in the project, arising out of the combination of drainage with the navigation, is described in manuscript on the plan annexed to the report.

With respect to the manner of carrying such a measure out, so far as is connected with drainage (which is for four-fifths or more of the whole distance), it should be under the provisions of the Drainage Act, in which every necessary power is contained, and by which, whoever provides the funds, the navigation would remain in the hands of the Commissioners, and the allocation of the tolls is provided for.

With reference to the degree of support to be granted by Government towards it, I am not prepared at present to give an opinion; much must depend upon the general principle which the Government and Parliament would take, in the matter of aid to such public undertakings, and a great deal as to the parties who would remain in possession, and the prospect of return in the shape of tolls, &c., on which at present we have little precise information.

If Government should be willing to grant aid towards such an undertaking (and I believe it would be excellent policy to do so), the more direct the manner of affording it, I should think the better.

As yet no official application under the Act has been made to the Commissioners of Drainage, nor funds provided to extend their inquiries as regards this district to the question of navigation; but when parties interested provide the means for so doing, as from some preliminary correspondence it is anticipated may be the case, we shall be enabled to give the fullest information, and be better able to express an opinion upon the prospects of such a measure.

I have, &c.
(signed) *J. F. Burgoyne.*

LETTER from *H. Porter*, Esq. Secretary of the Ulster Canal Company, to *W. T. Mulvany*, Esq., with Memorial from that Company.

Letter from H. Porter, Esq. to W. T. Mulvany, Esq. 9 October 1844.

Ulster Canal Office, Austin Friars,
London, 9 October 1844.

Dear Sir,

I beg to forward enclosed a memorial from the committee of the Ulster Canal Company to the Drainage Commissioners, in the form prescribed by you when I had the pleasure of waiting upon you in Dublin.

I shall remit, by to-morrow's post, with a request that it may be handed to you, the sum of 150 *l.*, in part of the deposit required by the Commissioners; and I am authorized by the committee to say, with reference to the conversation which passed between us, that the remainder of the deposit, not exceeding 200 *l.*, shall be paid when required by your Board.

I am, &c.
(signed) *Henry Porter*, Secretary.

To the Commissioners appointed for the execution of the Act 5 & 6 Vict. c. 89, intituled "An Act to promote the Drainage of Lands, and Improvement of Navigation and Water Power, in connexion with such Drainage, in Ireland."

The Memorial of the Undersigned,

Showeth,

That your Memorialists are proprietors of the Ulster Canal, in the counties of Armagh, Monaghan, and Fermanagh.

That they are desirous of having the same connected with the Shannon at Leitrim, by a navigation along the Woodford River and lakes, through the counties of Cavan, Fermanagh, and Leitrim.

That your Memorialists are desirous of availing themselves of the provisions of the Drainage Act above referred to, for the purpose of having such navigation made, in conjunction with relieving the lands along the same, and such others as your Board shall consider may be relieved by the necessary works, from flood and other injury by water.

That your Memorialists are ready and willing to deposit such sums as your Board shall deem necessary and sufficient for the several preliminary proceedings required to be taken.

And your Memorialists therefore pray that such navigation shall be made in conjunction with the drainage of all the lands so injured, under the provisions of the aforesaid Act.

Dated this 9th day of October 1844.

By Order of the Committee of Management of the Ulster Canal Company.
(signed) *Henry Porter*, Secretary.

LETTER from *Henry R. Paine*, Esq. to *Henry Porter*, Esq.

Letter from Henry R. Paine, Esq. to Henry Porter, Esq. 14 October 1844.

Office of Public Works, 14 October 1844.

Sir,

I am directed to acknowledge the receipt of your letter of the 9th instant, enclosing a memorial from the committee of the Ulster Canal Company for the connexion of that canal with the Shannon at Leitrim, by a navigation along the Woodford River and lakes, through the counties of Cavan, Fermanagh, and Leitrim, and stating that you will remit to Mr. James Perry, to be handed to the Board, the sum of 150 *l.* in part of the deposit required by the Commissioners, and that you are authorized to say that the remainder of the deposit, not exceeding 200 *l.*, shall be paid when required by the Board.

And I am to acquaint you that the money has not yet been received, but the Commissioners, on the undertaking given in your letter, to pay the further sum of 200 *l.* when called on, will now direct the inquiry as to the navigation to be proceeded with.

I am, &c.
(signed) *Henry R. Paine*, Secretary.

LETTER from *Henry R. Paine*, Esq. to *James Perry*, Esq.

Letter from Henry R. Paine, Esq. to James Perry, Esq. 15 October 1844.

Sir, Office of Public Works, 15 October 1844.

I HAVE to acknowledge the receipt of a Bank of England post bill for 150*l.* paid in by you on the part of Mr. Porter, secretary to the Ulster Canal Company, as part deposit for survey of Junction Navigation Drainage District.

I am, &c.

(signed) *Henry R. Paine*, Esq. Secretary.

LETTER from *Henry R. Paine*, Esq. to *John M'Mahon*, Esq. C. E.

Junction Navigation, Ballinamore Drainage District.

Letter from Henry R. Paine, Esq. to John M'Mahon, Esq. C.E. 2 November 1844.

Sir, Office of Public Works, 2 November 1844.

THE Ulster Canal Company having forwarded a memorial, and made the deposit, to extend this drainage inquiry to the purposes of navigation, you are requested to take the necessary steps to have the inquiry extended accordingly from Lough Erne to the Shannon at Leitrim.

And I am directed to acquaint you that you can have access to the original plans and documents relating to this subject received from the Shannon Commissioners, and will be furnished with a copy of Mr. Mulvany's report on this subject, printed in the year 1839.

It appears from late inquiries, that instead of an artificial canal for the whole distance, the Woodford River and its lakes, from Lough Scur, within four or five miles of the Shannon to Lough Erne, can, with but little exception, be made available for the purposes of navigation in conjunction with drainage, and your attention is therefore directed especially to this view of the subject.

From the summit near Lough Scur to the Shannon there is a stream which floods some lands, and in making the design for this part of the work (which it is assumed will require an artificial canal for the greater portion of the distance), care must be taken to provide for the drainage of the lands, in conjunction with the improvement of the navigation.

A feature of much importance in this extensive district is the mountain catchment of the rivers to the north of the main line, and the Commissioners wish the inquiry to be directed to the practicability of making the mountain rivers of greater size, if possible, discharge into the larger lakes, and adopting means to regulate the discharge of the waters gradually from the lakes into the lower country, both with a view to the prevention of injurious floods and the steady maintenance of a supply of water for navigation and mill power, for the latter of which there appears to be most favourable sites between the summit and the Shannon, whilst it appears that the cutting which it will be necessary to make at the summit may be made conducive to the discharge of some of the redundant flood waters from Lough Scur to the Shannon by the course of the stream referred to, and thus add essentially to the facilities for the drainage of this district.

It is advisable to investigate the practicability of shortening and improving the line of navigation by an artificial canal from St. John's Lough by the village of Eddentinny, to the Woodford River, or near Water Dale.

In addition to any information or views which you may be able to offer as regards the result of forming this navigation as a junction between the various inland navigations of Ireland, the Commissioners request that the fullest information should be obtained as to the local traffic of the district to be traversed by it, or immediately deriving benefit therefrom; and, for this purpose, you will endeavour to procure from the best authorities in the neighbourhood as accurate returns as can be obtained of the present traffic and relative prices at the market towns.

With reference to the scale of the navigation to be proposed, the Commissioners will be glad to have your opinion at any early period that the subject may be taken into consideration. From the great facilities which the river and lakes appear to offer, the Commissioners are under the impression that it should be suited to small-class steamers, worked either by paddles placed at the stern or the screw propeller. At all events, they are of opinion that it should be sufficiently large to admit of the passage of the largest boats that can at present navigate the Grand or Royal and Limerick Canals.

The Commissioners have informed the parties interested, that in their opinion a sum of 350 *l.* would be sufficient for the survey, valuation, and all other preliminary expenses connected with the navigation part of this inquiry, connected as it is with the drainage inquiry; and they request that you will so make your arrangements as to observe the strictest economy consistent with obtaining all essential information, and under no circumstances to let the expenditure exceed that amount without the Commissioners' sanction being first obtained.

I am, &c.
(signed) *Henry R. Paine*,
Secretary.

LETTER from *Henry R. Paine*, Esq. to *Francis La Touche*, Esq.

Sir, Office of Public Works, 9 November 1844.

I am directed to acquaint you that the Board having received a memorial and deposit from the Ulster Canal Company, to extend the inquiry to the question of forming a navigation through the drainage district from Leitrim by the course of the Woodford River to Lough Erne, and the engineers being now engaged in the necessary surveys, and the valuator in the valuation of the same part of the district, the Commissioners think it right to apprise the parties who signed the memorial for the extension of the drainage inquiry from Ballinamore to Lough Scur, &c., that in order to conduct the inquiry in which they are interested, satisfactorily, it is desirable that the deposit required by the Board's letter of the 10th September last should be made without delay, in order that while the engineers and valuators are in the district they may receive the necessary instructions to extend their inquiries to the objects of the memorialists in conjunction with those of the navigation.

Letter from Henry R. Paine, Esq. to Francis La Touche, Esq. 9 November 1844.

I have, &c.
(signed) *Henry R. Paine*,
Secretary.

LETTER from *Henry R. Paine*, Esq. to the Secretary of the Ulster Canal Company.

Sir, Office of Public Works, 26 March 1845.

Referring to your letter dated the 9th October last, forwarding the memorial from the Committee of the Ulster Canal Company for the connexion of that navigation with the Shannon at Leitrim, and the deposit which was subsequently made through Mr. Perry towards the expense of the survey of the Junction Navigation, I am now directed to inform you that the residue of the sum engaged to be paid for the service in question is now required, viz. 200 *l.*; and the Commissioners request that an early opportunity may be taken of putting them in possession of it.

Letter from Henry R. Paine, Esq. to the Secretary of the Ulster Canal Company. 26 March 1845.

I am, &c.
(signed) *Henry R. Paine*,
Secretary.

LETTER from *Henry R. Paine*, Esq. to the Secretary of the Ulster Canal Company.

Sir, Office of Public Works, 5 April 1845.

I beg to acknowledge your letter of the 3d instant, enclosing (on behalf of the Ulster Canal Company) a Bank post bill for 100 *l.*, being on account of the expenses of the survey for navigation purposes, in connexion with the proposed drainage of the Ballinamore district, which shall be lodged in bank to the proper account.

Letter from Henry R. Paine, Esq. to the Secretary of the Ulster Canal Company. 5 April 1845.

I will submit your letter to the Commissioners without delay.

I am, &c.
(signed) *Henry R. Paine*,
Secretary.

Ballinamore and Ballyconnell Drainage and Navigation District.

Report of John MacMahon, Esq. C.E.
30 May 1845.

REPORT to the Commissioners appointed under the provisions of the 5 & 6 Victoria, c. 89, on the Drainage of the Flooded Lands in the above District, and on the Line of the Junction Navigation for connecting Lough *Erne* and the River *Shannon*, and thereby the whole of the Inland Navigations of *Ireland*.

LIST OF PLATES.

Map of Ireland, p. 8.
First Diagram Sketch, Coologue, Derrycassin, Ballymagauran, and Garadice Loughs, to face p. 13.
Second Diagram, St. John's and other Loughs, to face p. 14.
Third Diagram, Map of District, to face p. 30.
Fourth Diagram, Section to follow it.

Office of Public Works, Dublin,
Drainage Engineer's Office, 30 May 1845.

Sir,

I have to request you will submit to the Commissioners of Drainage the accompanying Report and Appendices on the Ballinamore and Ballyconnell Drainage, and on a line of navigation in connexion therewith, for uniting the waters of Lough Erne with those of the River Shannon at the town of Leitrim.

The report contains a brief description of the present state of the proposed projects, and the probable results to arise on their being fully carried out.

Appendix, No. 1,—A detailed description of the present state of the rivers, streams, and loughs within the limits of the district under consideration, and of the country west of Lough Scur, through which the navigation is to be carried to the River Shannon.

Appendix, No. 2, contains detailed descriptions of the proposed works of improvement requisite for effecting the drainage of the land and the constructing of the navigation; also, estimates of the cost of executing the works, first, as a measure of drainage and navigation combined; second, as one of navigation alone; and third, an estimate of drainage irrespective of navigation.

On a comparison of these papers it will be seen that great advantages to the public will ensue from carrying out the combined measure of drainage and navigation, instead of either of the projects uncombined. Thus, in the estimate for the combined measure,

	£.	s.	d.	£.	s.	d.
Navigation is set down at - - -	92,501	4	4			
Drainage - - - - at - - -	17,800	–	–			
				110,301	4	4
Navigation alone - at - - -	103,000	–	–			
Drainage alone - - at - - -	23,267	5	10			
				128,267	5	10
Saving, equal amount of gross difference - -				£. 15,966	1	8

Or, for each measure:

	£.	s.	d.
Navigation alone - - - - -	103,000	–	–
Ditto, combined - - - - -	92,501	4	4
Difference - - - - -	£. 10,498	15	8
Drainage alone - - - - - -	23,287	5	10
Ditto, when combined, - - - -	17,800	–	–
Difference - - - - -	£. 5,467	5	10

Appendix, No. 3, are extracts from a report made to the Shannon Commissioners in 1838, for a navigation having similar objects in view with that now observed upon, namely, the connecting Lough Erne with the Shannon. They relate principally to the traffic and circumstances of the country through which the line passes, or is connected with; and as the statistics they afford are valuable, I felt it my duty to have them annexed.

I remain, &c.
John MacMahon, C. E.

Henry R. Paine, Esq. Secretary,
Board of Public Works.

Report of John MacMahon, Esq. C.E. 30 May 1845.

REPORT on the *Ballinamore* and *Ballyconnell* Drainage, and on the Formation of a Line of Navigation in connexion therewith from Lough *Erne*, in the Counties of *Cavan* and *Fermanagh*, to the River *Shannon* at *Leitrim*, by which an uninterrupted Communication may be opened between the Navigations (both natural and artificial) in the South, Midland, and West of *Ireland*, with those now existing and proposed in the Province of *Ulster*.

IN the summer of 1844, the owners of the land injured by the floods of the Woodford and Yellow Rivers, and their tributaries, applied to the Drainage Commissioners to extend to their properties the benefits derivable from the Act above referred to; and in the course of the last winter, the Ulster Canal Company being desirous of having Lough Erne (into which their canal enters) connected with the River Shannon at Leitrim, by a navigation along the Woodford and Yellow Rivers, and the lakes throughout the counties of Cavan, Fermanagh, and Leitrim, also applied by memorial, expressing their wish to avail themselves of the Drainage Act, for the purpose of having such navigation made in conjunction with the measure for reliving the flooded lands.

In the month of November last I received the Commissioners' orders to combine the survey for this navigation with the one then in progress under me for the drainage of the Ballinamore and Ballyconnell district, so as to lessen the expense of the survey on each as far as it was practicable, obtaining at the same time all the information requisite for ascertaining the expense of both.

These surveys being now concluded, it may be well (previous to entering on the consideration of the details upon which the estimates are founded) that I should here allude to the early views entertained of a project for uniting those great waters, and to the advantages which the carrying out of the measure now will, in my opinion, confer upon a considerable portion of the agricultural and trading communities in nearly seven-eighths of the counties in Ireland, besides fulfilling the objects of the primary survey, by freeing from floods the valuable lands on the margins of the rivers and lakes throughout this entire district.

We have existing testimony by works never finished (the Caroul Lock), the remains of which are still visible, that the making the Woodford River navigable from the lake which then bore its name (now Garadice) to Lough Erne, engaged the attention of the landed proprietors of Cavan and Fermanagh early in the 18th century; and we find that in the year 1793, the parties interested engaged the professional services of Mr. William Chapman of Newcastle, a clever and intelligent engineer, then practising in this country, "to submit to them his views on the means of making the Woodford River navigable as an off-branch from the Lough Erne and Ballyshannon navigation."

In observing on the Woodford measure to its promoters, this clear-sighted man adds, that "although I have made no survey of the district, I am quite satisfied that the same system of navigation I here recommend may be carried on, with much advantage to the country, from that point (Woodford) to the Shannon at the town of Leitrim."

In the year 1793, when these opinions were advanced, neither the Grand or Royal Canals were connected with the Shannon, nor was that noble river itself, as a navigation, in any respect improved beyond the imperfect projects and ineffective mechanical contrivances of the Dutch engineer, Omer, which remained to mar the trade of that great highway until the year 1800, when its conservation was placed in the hands of the Directors-general of Inland Navigation. How strongly, therefore, must the advantages of a navigable communication from Lough Erne to the Shannon be marked, when at a period so far back as 1793, it was manifest to the mind of a stranger (Mr. Chapman) but a short time in this country, that its execution even then would importantly serve the interests of Ireland, naturally looking forward, as he did, to the completion of the Grand and Royal Canals (since finished), and the improvements in the navigation of the River Shannon, now in progress, and rapidly drawing to completion!

Notwithstanding the strong opinions entertained and expressed by the landed interest in favour of this measure from 1793 to 1805, they were unattended to; the work was never attempted, nor any notice whatsoever taken of the project until 1838, when the Shannon Commissioners being called upon by the Lords of Her Majesty's Treasury, "to report on the practicability of making a canal between the Rivers Shannon and Erne," instructed one of their engineers, W. T.

Report of John MacMahon, Esq. C.E. 30 May 1845.

Mulvany, Esq., "to examine the country with a view to the formation of a canal to connect the River Erne at Belturbet, (or the point, near Wattle Bridge, where the Ulster Canal is to open into the River Erne,) with the River Shannon, near Drumsna."

This engineer made a general examination of the country lying between Lough Erne and that part of the River Shannon extending from Lough Forbes to Lough Allen, and after a minute survey of the summits of the country which divides the valley of the Shannon from that of the Erne, found three practicable passes amongst this range of hills.

The first at Letterfine, near Lough Scur, between Leitrim and Ballinamore.
The second near Fort Lough, between Mohill and Carrigallen; and
The third at Clooncoose Lough, near Ballinamuck, on the boundary between the counties of Leitrim and Longford.

He made choice of the first, or Ballinamore line, affording as it did the greatest extent of engineering facilities, coupled with the largest amount of commercial advantages, having its summit (but 220 feet above the level of the sea) amply and I may add inexhaustibly supplied, from the conserved waters of lakes extending over 614 acres, with a catchment basin exceeding 10,000 acres.

The line was then proposed to be carried through valleys, easy of access, which intersect the country almost in direct courses from the Shannon to the Erne, falling from the summit on the one hand towards the Erne, with a descent of 69 feet, on which it was designed to have 8 locks; on the other, to the Shannon, with a fall of 81 feet, on which there were to be 9 locks.

It was also intended, as shown on the map attached to the Report, that this line of navigation should depart from the Shannon at Leitrim, and passing southward of Loughs Scur, Conway, Carrigport, and Drumleague (the waters of which were to be taken in for the supply of the summit), proceed by St. John's Lough, to the market-town of Ballinamore, and running north of Garadice, Ballymagauran, Derryhassen, and Coologue Loughs, enter the River Erne, about one mile from the town of Belturbet. The entire length is 29½ miles, and the estimated cost amounts to 153,000 *l.* (*see* p. 13 of the Report on that measure).

The course recommended for the canal in this preliminary survey is the shortest facile line the country presents; but the design being for a still-water navigation, with the exception of one mile of the River Erne, its execution would have been from necessity (as shown by a comparison of the general estimates) expensive.

At the time this canal was projected, the applicability of steam propulsion in narrow waters, even by means of the Archimedean screw, was not generally admitted; and although the advantages to be derived by combining "drainage, navigation, and improvement of mill-power" in one measure were not unknown, there was no legal power existing in the country until the passing of the Act, the 5 & 6 Vict. c. 89, by which such undertakings could be effectually carried out. Had the law here adverted to been in force in 1838, the line through the rivers and lakes would doubtless have been made choice of in preference to the still-water canal, possessing, as the former does, many other advantages besides that of economy.

The present application to the Drainage Commissioners by the Ulster Canal Company, an influential and numerous body of men, practically acquainted with such measures, and the promptness with which they agreed to meet the expenses of the engineering inquiry into the merits of the proposed navigation, are evidence that they who are locally acquainted with the country fully appreciate the benefit its execution would confer—a benefit, I can aver, not alone confined to improving the property these gentlemen represent, but extending its useful influence over the interests of a most valuable and industrious body of our countrymen, engaged in the trade and agriculture of the north, centre, and west of Ireland.

In the foregoing I have endeavoured to explain, in brief terms, the general circumstances which have attended the progress of this important project from the time it first received professional consideration in 1793, down to the present period.

On the map of Ireland prefixed to this Report, I have for the Commissioners' information, marked in red lines the course of the navigation by which it is proposed to connect Lough Erne with the River Shannon. This course is under 40 miles in length, 25¾ of which run in the beds of rivers; 6¼ through navigable lakes; and 7½ miles of still-water canal in rather favourable cuttings.

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The construction of this comparatively inexpensive navigation, the cost of which will not exceed 92,501 *l.* (*see* estimate A, Appendix, No. 2). would supply the only link now wanted for uniting in one comprehensive system the whole of the navigable rivers, lakes, and canals in the kingdom, excepting the Slaney to Enniscorthy, the Southern Blackwater to Lismore, and the Boyne to Navan; and in proof of the comparative cheapness of the line here recommended, it may be satisfactory to those not acquainted with the history of Irish canals to learn,

That the execution of the Grand Canal cost 18,610 *l.* per mile,
That of the Royal Canal cost 19,750 *l.* per mile,
And that of the Ulster Canal, with locks of but 12 feet in width, cost upwards of 5,000 *l.* per mile;

whilst the execution of the line now under consideration, coupled with the cost of freeing from floods upwards of 6,157 acres of land, possessing the seeds of great fertility, is estimated for, and capable of being executed at an expense not exceeding 110,301 *l.* Of this sum, 92,501 *l.* is chargeable to a navigation 39¾ miles in length (say 2,300 *l.* per mile), and the remaining 17,800 *l.* to the drainage of 6,157 acres of land, being at the rate of 2 *l.* 17 *s.* 10 *d.* per statute acre.*

Important facilities will by this project be also afforded to the commercial intercourse, which it is the interest of the country should be extended between the fertile and productive valleys of the south and west of Ireland, and the populous and wealthy manufacturing districts of Ulster, as well as the thriving ports on our eastern seaboard.

The measure will also be attended with advantages to trade, which require but little comment to explain, namely, the cheapening of transit. When it is borne in mind how large a proportion of the price of Irish agricultural and mineral produce is absorbed by the cost of carriage to suitable markets, owing to the imperfect state of our highways, it will be readily admitted that whatever creates a saving in this cost, benefits the public interests; and I with confidence state, as a general principle, that the cheapest and most convenient road, within certain limits as to speed, is "the Water Road."

The commercial benefits which the construction of this navigation is likely to afford being here brought cursorily under the notice of the Board, I now turn to an equally interesting portion of the inquiry, namely, the extent of trade which may be expected to originate on this navigation.

I reckon that in addition to the local traffic†, which as a matter of course this line is certain to command, an important accession to its trade will be derived from the re-opening and working on an extended scale of the Arigna iron mines, and the valuable coal field of the Lough Allen district, as well as from the increased produce of the roofing-slate quarries at Killaloe, the management of which is now in the hands of enterprising capitalists, desirous to extend their sales in all directions throughout the country; and in no quarter is the demand for these slates likely to be greater than in the province of Ulster, where, from the improved means and habits of the peasantry and small farmers, mainly attributable to the influence

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* The increased value put upon the 6,157 acres of lands to be improved, the valuator, Mr. Brassington, has informed me, will amount to about 1,800 *l.* per annum, which will yield a profit on an outlay of 17,800 *l.* of more than 10 *l.* per cent. per annum.

Drainage alone would produce the beneficial results above stated, but would still leave the fruits of the soil burdened with the pressure of expensive transit on common and frequently inconvenient roads. How different would the case be, and how greatly would the advantages be increased, not only to the owners and occupiers of the reclaimed land, but to those of the whole district within certain limits, if by the construction of a navigation such as is now proposed, the cost of carriage should come to be reduced from the lowest present average, 6 *d.*, to 2 *d.* per ton per mile, say 66 *l.* per cent.; and, in addition, the means be obtained, under the circumstances in which the present project would be placed in conjunction with such an extent of existing navigations, of enlarging the beneficial limits of the producers' market circle almost in the same ratio.

† The very superior flag and sandstone quarries along the southern side of the Slieve-an-Eirin and Slieve Rushen mountain range, easy of access from the line of the proposed navigation, ought in themselves to yield a considerable return to the annual toll table; but it is a matter of regret that amongst the great proprietors of this extensive district, there appears but one (Dr. Collins of Dublin) aware of the great money value of the stone material so abundant and so easily won along the sides of these lofty hills. On his property at Gortahurk and Tonymore, sandstone of very superior quality, and agreeable and even colour, is found by his present workings to exist to a great extent in those townlands; and I am informed that on the carrying out of the navigation measure here proposed, he means to open and work them on the most improved and extensive scale, so as to fit the produce for competition with the best of the Scotch or English quarries.

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influence of temperance, now so prevalent, they have learned to value whatever increases their heretofore scanty stock of comforts: hence they wish to give a preference to the use of slates as a roofing cover (when to be had on reasonable terms) instead of thatch, aware that it affords security and permanence to their humble dwellings, besides increasing in a great degree their healthiness.[*]

Then, as to the mineral value of this division, Professor Kane in his pre-eminently useful work, "The Industrial Resources of Ireland," chapter IV. gives an elaborate and instructive description of Arigna and of its works, having previously, in the first chapter, satisfactorily explained the properties and extent of the coal field, from whence the fuel was had for the process of smelting.

It would in me be an act of injustice towards the readers of this paper to try and compress within the limits of an engineer's desultory report the valuable detailed observations of this eminent man on a subject of such national importance; I therefore refer them to the text, making the following short but conclusive extract from page 143:—

> "From the various estimates drawn up by those who have inspected the locality, as well as from the analysis of the cost of the production of iron in Scotland, England, and Wales, there remains little doubt but that cast iron of the best quality can be obtained at Arigna, at an expense of production probably falling sensibly under, but certainly not exceeding, 3*l.* per ton."

In drawing conclusions as to the remunerative prospects of this project, it may possibly conduce to a better understanding of the question, to compare the present charges for land carriage with those that should, in my judgment, yield a profit on water carriage in this locality.

The cost of land carriage remains now as it stood in 1838, ranging between 5*d.* and 9½*d.* per ton per mile.

Viewing the amount of traffic on the proposed navigation hypothetically, and granting that 100 tons of goods, or two boat loads, are carried daily from the Shannon to Lough Erne, and one boat, or 50 tons, from Lough Erne to the Shannon; at the same time assuming a charge for the use of this navigation sufficient to cover the cost of maintenance and interest on outlay, at but 1*d.* per ton per mile, we have 150 tons carried 40 miles at 1*d.* per ton per mile, equal to 25*l.* per day for 300 days, or per annum 7,500*l.*; in other words, 45,000 tons[†] are carried 40 miles at 1*d.* per ton per mile for the same amount.

The cost of establishment and maintenance I estimate as follows:—

	£.	£.
2 terminal agents at 100*l.* each - - - -	200	
6 lock-keepers, for 17 locks, at 20*l.* each - -	120	
2 practical overseers at 80*l.* each - - - -	160	
4 water bailiffs at 20*l.* each - - - - -	80	
		560
The cost of maintenance I reckon at 50*l.* per mile per annum, which for 8 miles of still-water canal equals - - - - - - - -	400	
25 ditto of river at 20*l.* - - - - -	500	
7 ditto of lakes at 10*l.* - - - -	70	
Incidents and reserved fund - - - - -	300	
		1,270
	£.	1,830

which leaves a surplus of 5,670*l.* to meet interest on an expenditure of 92,501*l.*, being upwards of 6 per cent. per annum on the outlay, exclusive of drawbacks from other canals, whose trade may make use of this navigation.

I now take leave to submit a general description of the present state of the rivers, streams, and loughs comprised within the limits of the district under consideration, and of the country west of Lough Scur, through which the navigation

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[*] In the Report on the Sanitary Condition of the Labouring Population of Great Britain, presented to Parliament in 1842, in describing the cottages of the labourers in the neighbourhood of Stratford-on-Avon, it is stated that decayed thatch yields a gas of a most deleterious quality. Fever of every type, and diarrhœa, are endemic diseases in such dwellings. It has been also observed, "that it is much more difficult to get rid of fever in thatched than in slated cottages."

[†] The gross amount of tonnage, per annum, on the Lagan Navigation, 44,700 tons; ditto, on the Newry, 102,332 tons.

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is proposed to be continued to the River Shannon; together with an outline of the engineering measures I propose to recommend for carrying out the Board's instructions in reference thereto, comprehending the drainage of the flooded lands, the construction of the Junction Navigation, and the improvement of mill power; the details of which, as also of the estimates, are fully set forth in the diagram plans, and appendices.

The Woodford River and the Yellow River are the main conduits by which the drainage waters of this district are discharged into Lough Erne, about seven miles below Belturbet. Owing to the numerous natural and artificial obstructions in the course of these rivers, they are quite inadequate to discharge the floods which pass with great precipitancy from the Slieve-an-Eirin and Slieve-Rushen mountains, down the steep declivities of the northern side of the basin, to the great prejudice of the lowland farmer, the produce of whose labours must on this account be at all times precarious.

To relieve the land from such occurrences, the obvious means are to enlarge the existing water-courses, and to conserve the flood-waters in all the available reservoirs the district affords, so as to check their impetuosity, and consequent destructive action upon the lands in the valleys.

Great natural facilities present themselves for this purpose, as the line of the proposed navigation will pass through a chain of lakes peculiarly applicable to serve as reservoirs, both from position and extent. The first group consists of the Coologue, Derrycassin, Ballymagauran, and Garadice Loughs, and spreads over an aggregate area of 1,470 acres, as shown on the annexed sketch.

The catchment or rain basin that supplies these loughs extends over nearly 90,000 statute acres; therefore the area of the reservoir (1,470 acres) would be about one-sixtieth that of the catchment basin.

In the project for regulating the level of these waters it is proposed to lower the present summer surface 2 feet 6 inches, and by a weir, in conjunction with other engineering arrangements, to prevent the flood-waters rising to a greater height than the present summer level, still leaving a range of 2 feet 6 inches in the water surface.

It has been found by the observations and admeasurements of one of the engineers (Mr. Forsyth) appointed by the Board to assist me, and who conducted this inquiry with great skill and assiduity, that the quantity of water arriving at the reservoirs during and immediately succeeding a great fall of rain, equalled 96,000 cubic feet per minute.

The river channel below the intended regulating weir will have a capacity equal to the discharge of 70,000 cubic feet per minute only; therefore the quantity, 96,000 cubic feet, arriving at the reservoir during and after a heavy fall of rain, will exceed the power of discharge by 26,000 cubic feet per minute, even when the regulator is discharging a maximum quantity; and allowing it to take six hours after the first flood-water reaches the reservoir before the supply has arrived at its greatest quantity (96,000 cubic feet per minute), the average amount of water entering the reservoir over and above the summer supply will, after deducting the increased discharge due to increased height at the regulator, equal 13,440,000 cubic feet: this addition will raise the surface of the lakes 2½ inches above the summer level.

Assume that this process continue, and allow that 96,000 cubic feet arrive at the reservoir every minute, that the discharge at the weir progressively increases until it reaches its maximum (70,000 cubic feet per minute), at the end of 24 hours it will have received a quantity sufficient to raise its surface 15 inches above its summer level. If the process be continued still, it will be also found that in 48 hours more (the same circumstances remaining) the surface of the water in the reservoir will be raised to the limit of its greatest range, that is 2 feet 6 inches above its summer level, or the height of the present low summer water; 78 hours or 3¼ days are thus required to fill the reservoir to the stipulated height, supposing the flood-water to flow in the quantity stated without intermission, and it is presumed that the instances will be rare, if they ever occur, in which rain would continue to fall without ceasing for so long a period; but granting the supply to intermit, and the discharge to continue uniform, the waters could not attain to, much less could they exceed, the stipulated height, and therefore the quantity to be discharged would not be too great for the capacity of the channel below the weir to pass freely, and thus save the banks and adjoining low lands from being flooded. By adopting these principles we obtain a dominion over the motion, force, and volume of the currents, and are also enabled to calculate with sufficient

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accuracy the required slope of the discharging channels as well as their sectional area.

In addition to the enlargement of the conduits and to the conserving of the flood waters in the loughs referred to, we further avail ourselves of the advantages of this valuable system through the aid of a second series of receiving basins (the St. John's Lough, Marrave, and Lough Scur) for relieving an extensive division of the country from the mischief inflicted upon it through the means of two impetuous mountain torrents, the Yellow and the Aughacashlane Rivers; these have their rise in the Slieve-an-Eirin and Bencroy mountains, and in times of heavy rain it is almost incredible the extent to which their floods carry destruction. A portion of their courses are marked on the opposite sketch as well as the lines proposed for diverting their waters), that of the Yellow River into St. John's Lough, and of the Aughacashlane into Lough Scur.

The cluster of loughs which form our summit supply are the same as those pointed out by the Shannon Commissioners' engineer, namely, Loughs Scur, Conway, Carrigaport, and Drumleague; they contain an area of 614 statute acres (*see* preceding sketch), and their summer discharge, irrespective of any conserved waters, will form an ample supply for the greatest extent of traffic likely to arise on this navigation.

For the purpose of draining the lands on the margin of these loughs, as well as to obtain a sufficient conservative range, it is intended to reduce the summer level of their waters two feet, and not to allow the winter floods to rise above the level at which the summer water now stands.

From Lough Erne to the proposed summit level (Lough Scur) there is an ascent of 66 feet, which is to be overcome by the construction of eight locks, of lifts varied to suit the circumstances of the river bed.

At the western end of our summit, the main portion of the still-water canal commences and extends about 4½ miles in length, descending the easy slope of the valley through which the waters from Drumleague Lough run, until they join the River Shannon at Leitrim; the fall amounts to 78 feet, to regulate which there are nine locks required.

The locks on this navigation (17 in number) I propose to be of the following dimensions, namely, 82 feet from cove to cove, 16 feet in breadth between the quoins, and to have 5 feet 6 inches depth of water on their sills.

I have made choice of these dimensions with a view to facilitate the introduction of steam tug boats on the screw principle, capable of navigating not only the rivers, lakes, and still-water portion of the Junction Canal, but also the broad waters of the Shannon and Lough Erne. Besides that, the boats in use on all the other Irish canals will pass freely through these locks.

In recommending the introduction of steam as a motive power on narrow canals, where I am obliged, for the security of the works, to limit the speed to a rate at which this great agent competes with horse power with least advantage, I have taken into consideration the peculiar circumstances of the Junction navigation, having 34½ miles out of nearly 40 (its whole length) in lakes and rivers, on which steam can be used at high rates of speed. Were it otherwise, and that the line had to be carried for its entire length in the ordinary-sized channels assigned to still-water canals, notwithstanding I hold the opinion that even on narrow canals steam is cheaper than horse-power even at the low rate of speed adverted to, I should not venture at present to urge its adoption by the public.

I have next to observe on the extent of new mill power which this line of navigation may be made to afford whenever the commercial demands of the country require it. The aggregate amount of effective fall thus attainable equals 64 feet, distributed (on the navigation itself) amongst eight localities easy of access from the surrounding country. *See* details* reduced into a tabular form at next page.

There are at present but four working mills in this district; that at Ballyconnell manufactures flour in one division of the concerns, and oatmeal in the other; the remaining three mills grind nothing but oats. Their position, present circumstances, and the increased power that may be given to them, is set forth in the Appendix, No. 2.

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* The details referred to give the falls attainable at each locality respectively. The quantity of water said to be available at each site is the average summer discharge; this quantity can be considerably increased, and the efflux rendered equable throughout the entire season, by extending, at no very great additional expense, the works in connexion with the receiving basins, and incurring a small annual charge for an establishment to superintend those works, and to deal out the conserved waters, with due regard to economy and convenience.

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TABLE exhibiting the Position and Circumstances of the Mill Sites on the intended Navigation.

No. of Lock.	SITUATION.	Proposed available Fall. *ft.* *in.*	OBSERVATIONS.
1	At Caroul Shoal - -	6 –	- - The summer discharge available may be taken here at an average of 15,000 cubic feet per minute.
2	Ballyconnell, 1 mill, now standing.	10 –	- - The present fall is but 5 feet 6 inches; there are two sites here, only one occupied. The discharge may be considered equal to 12,000 cubic feet per minute.
3	At Skeelane Ford - -	6 6	- - The fall here is variable, as the waters are conserved in the loughs above it. The discharge may be taken at 10,000 cubic feet per minute.
4	At Agboo - - -	6 –	- - The fall here is variable also. The discharge may be taken at 8,000 cubic feet per minute.
5	Below Ballinamore - -	6 –	- - The discharge is the same as the preceding one.
6	Above Ballinamore - -	8 6	- - The mill here is placed on the south side of the high road from Ballinamore to Carrick-on-Shannon, but the water is had from the seventh level. The discharge may be taken at 7,500 cubic feet per minute.
7 8 & 9	At Ballyduff, near St. John's Lough, are summit locks, and therefore not prudently available for milling power.	9 6	- - A corn and bleach mill stood here formerly; they are both now razed: the fall they worked with did not exceed 5 feet. The discharge may be taken at 7,500 cubic feet per minute at least.
12	At Newbrook - -	11 –	- - The discharge can only be taken at 4,500 per minute. This is the first and only site we can advantageously obtain in the line descending from the summit to the Shannon.
	TOTAL effective Fall - - -	63 6	

	£.	s.	d.	£.	s.	d.
It will be seen, on reference to the estimates in the Appendix, that the combined measure of drainage and navigation is stated to cost - -				110,301	4	4
See Appendix 2, Estimate A { Navigation - - -	92,501	4	4			
{ Drainage - - - -	17,800	–	–			
A navigation constructed without being combined with drainage will cost - - - - - - -	103,000	–	–			
And drainage if carried out alone, (see Appendix 2, Estimate C.) - - - - - - -	23,267	5	10			
				126,267	5	10
Difference - - - £.				15,966	1	6

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On combining the drainage of the Ballinamore and Ballyconnell district with the proposed navigation from Lough Erne to the Shannon, we obtain a much more extensive and permanent system of drainage, besides effecting a saving on this branch of the measure alone amounting to 5,467*l.* 5*s.* 10*d.*

In the foregoing Report I felt a desire to express in as popular a form as the subject would, in my hands, admit of, the leading engineering points which bear upon the question intrusted by the Commissioners to me to consider. I am fully sensible that the arrangement is far from being as perfect as it might be, and therefore not as explanatory as I could wish; but by coupling the general principles connected with the inquiry which it treats on with the details in the Appendices, I trust the information the Commissioners desired to obtain will be found to be afforded.

In conclusion, I beg to be permitted to express the very favourable opinion I entertain of the zealous and talented services rendered by the engineers, Messrs. Forsyth and Fraser, and by the assistant engineers, Messrs. Gerrard and Ottley, appointed by the Board to assist me on this survey, the field-work of which was necessarily carried on at an inclement season of the year, and under other rather unfavourable circumstances.

Office of Public Works,
May 1845.

John MacMahon, C. E.

Appendix, No. 1.

Appendix, No. 1.

DETAILED Description of the present State of the Rivers, Streams, and Loughs, comprised within the limits of the District under Consideration, and of the Country West of Lough *Scur*, through which the Junction Navigation is proposed to be carried to the River *Shannon.*

The Woodford River (*see* Diagram, Map, and Section) discharges itself into Lough Erne, about seven miles below Belturbet, and between the townlands of Coragh, in the county of Cavan, and Mullynacoagh, in the county of Fermanagh. The channel, at its entrance into the lough, is obstructed by an extensive shoal, on which there are little more than two feet of water in summer. On this shoal there are the remains of an eel-weir, and as in almost all cases where the clear river-course has been obstructed by such nuisances, an island has been formed, extending nearly the whole length of the shoal, and dividing the river-course into two channels for 450 feet in length.

From this shoal upwards to that at Killynick Wood, the bottom is soft, and the least depth in the channel about seven feet at low summer water. The breadth varies from 80 to 120 feet.

At Killynick Wood the river is again divided into two channels by an island composed of hard clay and sandstone boulders, many of them in large masses. The south channel is the most direct, although of the least dimensions; the depth of water is about two feet, and the length of the shoal 120 feet.

The reach above this shoal is deep, and the bottom soft, the width 80 feet and upwards. Between the townlands of Corrahack, county Cavan, and Aghalane, county Fermanagh, the river shoals to about 3½ feet for a distance of 158 feet on an average, the north or Aghalane side for only about 30 feet in length. From this shoal to Aghalane Bridge, the depth generally is from 6 to 9 feet, and the width 80 feet and upwards, and from this bridge back to the Erne, the surface of the meadows adjoining the river varies in height from 6 inches to 3 feet above the surface of the river during low summer water.

Aghalane shoal, on which a bridge connecting the counties of Cavan and Fermanagh stands, is composed of nearly the same materials as the last; viz. clay and shingle mixed with sandstone boulders, &c. The river-course being divided an island is formed, but whether natural or artificial does not appear.

The trees growing on this island are large and of long standing. The remains of a weir (or where there was an attempt at making one) appear just above the bridge on the south side, and runs obliquely to the upper end of the shoal, about three-fourths across the river. It is formed of large boulder stones. Willow branches, borne down by the floods, have attached themselves to these stones, and taking root have formed small islands in several places. The bridge is old, and in a very crazy condition; it has been in contemplation for some time to build a new one at the joint expense of the two counties; the entire ascent to this shoal in summer is about two feet. From Aghalane shoal upwards, the river again runs deep and wide for some distance, the width varying from 70 to 120 feet, the depth from 5½ to 14 or 15 feet, and where least the bottom is hard.

Between the townlands of Kilcorby, county Cavan, and Drumettagh, county Fermanagh, there is a shoal 160 feet in length, and the depth of water on it in summer is only from 9 to 12 inches. Immediately above this shoal the width and depth of the river is very variable. The west bank is formed of blueish clay, very precipitous, and from being undercut by the stream, has slipped to a great extent in several places.

Between

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Between the townlands of Corraquil, county Cavan, and Drumettagh, county Fermanagh, there is an eel-weir, situated on a shoal, and at this weir the influence of the floods of Lough Erne ends. The entire of the meadow lands adjoining the river from the lough to this point are submerged during the winter floods, independently of the river. The high floods of the Woodford River frequently cover these low lands, apart from the influence of the lough; besides, the general level of the meadows is so little above the summer level of the lough, that on the rising of its waters in winter, they continue to be overflowed for a large portion of the year. Ascending from the eel-weir, the banks of the river become bolder, especially on the north side, where the land rises to a considerable elevation. The ravine through which the river runs is narrow and tortuous, the water shoal, and the channel much obstructed by islands, eel-weirs, and stepping-stones. This shoal is generally known by the name of Caroul, and here we meet the first of those unsuccessful attempts at making the Woodford River navigable, adverted to in the Report. At the lower end of this shoal, in the townland of Corraquil, county Cavan, the excavation for a lock to overcome the ascent here, which is about six feet, is still partially open, and the trace of the side cut, connecting it with the river at the upper end of the shoal, and by which the unfavourable part of the river was to be passed, may still be seen, although in many parts of it the ground is little more than broken. At a sharp turn or elbow in the river, near the middle of Caroul shoal, on the north side, between the townlands of Corry and Derrybooley, county Fermanagh, is the entrance of a river which is the main discharging conduit for the surplus waters of a great part of the southern side of Slieve Rushen, and the subjacent valleys. This river presents a melancholy spectacle of the destruction which ensues from suitable provision not being made for receiving and passing off the water descending from the mountain to the valleys in time of heavy rains.

Many of the small branch streams which form this river have their rise quite at the top of the mountain; the fall in the first two miles of their course is very precipitous, amounting probably to 1,000 feet. As the top of the mountain is 1,200 feet above the sea, and the floods descend on the valleys with great force, covering to the depth of from two to four feet the rich bottoms in several townlands through which they flow, and when they become united into one stream of river, the townlands of Teemore, Derryhooly, and Corry, especially suffer from their violence and suddenness. Generally in three or four hours from the commencement of heavy rains the floods reach this part of the river, and hay, corn, flax, or whatever produce may be within their influence, are swept away, and scattered and tangled amongst the willows, thorns, and other brushwood, which cover a great part of the callows adjoining the Woodford River. Obstructions of any kind presented to the downward passage of these waters create currents and eddies, by which the soil is torn into deep pits, and long and deep winding courses, destroying scores of acres of the richest land in the whole district.

Several of the bridges which cross this mountain river are evidently deficient in waterway, as the floods overflow the roads to a considerable extent, and this evil is in some measure increased by the total incapacity of the present water-course, which is a succession of deeps and shoals with broken banks and an extremely crooked channel, choked by willows and weeds. There are three bridges on this river with which we have to deal, one of two 12-feet arches, on which the public road crosses, in Garvary and Derrylany, and two wooden bridges, with stone abutments, of 20 feet span each, for townland accommodation.

Leaving Caroul shoal, the river increases in width to from 14 to 18 feet, and is upwards of 100 feet in breadth, with a soft mud bottom. At present the low summer water is only one foot six inches to two feet below the adjacent meadow land, the land drains are therefore very insufficient; they have no fall in themselves for a great distance, and being always full of water, the soil derives but little advantage from them even in the dry season, and on the least rise in the river after rains the whole of the low bottoms are covered. The river meanders through this reach very much, and forms several sharp turns, which greatly impede the free discharge of the water.

On the north side of the river, between the townlands of Dernagore and Cloncoohy, a stream flowing from Drumderg Lough enters the Woodford River; it is principally supplied by several rivulets, all descending, as in the other tributary case, from Slieve Rushen; it may be said of them that in dry weather there are no streams on the face of the mountain, and the small quantity that flows through the valleys is supplied by springs at its base; but a few hours' rain swells each of them, so that they suddenly assume a formidable aspect, and discharge themselves into Drumderg Lough, through which the united waters flow in an obstructed course, or rather over a continuous hollow swamp, overgrown with almost all species of aquatic plants, until it arrives at Cloncoohy Lough, and thence to the Woodford River by a short channel, in which it is retarded by stepping-stones and wooden crossings. On quitting these swampy bottoms, the river-course is confined between Ballyconnell demesne and the high land of Cloncoohy; its breadth varies from 40 to 80 feet, and its least depth is about 4½. Near the drain, on the north side of the river, by which the county mearing runs northwards, the river divides, and forms an island of considerable extent, presenting great resistance to the free discharge of the water, by the very tortuous course of the western branch, and the inadequate capacity of the eastern one. A short distance from this island the direction of the river has been greatly influenced by the numerous cuts made from time to time for discharging channels from the Ballyconnell mills.

It is very apparent that the floods have frequently overflowed the space occupied by these discharging courses, and that by being pent up between them and the river, have formed new channels, and choked up and diverted old ones, so that no part of the ground has been left untraversed by the river floods at one period or another.

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The flour and corn mill at Ballyconnell, the property of William H. Enery, esq., is of much importance to the town and surrounding country. In it a considerable trade is carried on, especially in the manufacture of flour, the mill being kept at constant work for at least 10 months in the year; the remaining two months there is a slackness of water. The flour is chiefly sold in the neighbourhood, although it is sometimes sent to a distance. The power of this mill is capable of considerable improvement; at present there are two wheels, each driving two pair of stones.

The bleach-mill which formerly stood a little higher up has been razed, and the fall remains unappropriated.

The river immediately below the mill-weir is greatly choked up by willows, and the weir itself requires some repairs.

Above the weir the river is wide, but shoals very much at the bridge. This bridge has three arches, the centre arch 20 feet span, and the two side arches 18 feet 8 inches each.

Above the bridge the river is wide and deep, and the banks very low, being only a few inches above the surface of the water in summer.

At the distance of half a mile above the bridge is the confluence of the Crooked River, another mountain torrent, having its source in Lough Mac Martin, on the top of Slieve Rushen, 1,259 feet above the level of the sea. The character of this river is so similar to that described as having its confluence with the Woodford River at Caroul shoal, that it is not necessary to repeat the description. A shoal of some magnitude is being formed at the confluence by the debris brought down by this river during floods.

From the junction of the Crooked River to Coologue Lough, a distance of six statute miles, there is no tributary deserving of particular notice; therefore the description will be confined exclusively to the river itself. In this division it possesses very varied features; for a short distance it is deep and its velocity trifling, soon it becomes shoal, of great width, and the stream divided by numerous small islands; the banks are very low, broken and swampy, and partially covered with rushes.

At Augharaskilly the river is divided into two branches by a large island; the north branch is the largest. The island is covered with thorn bushes and detached masses of limestone, affording only a scanty and precarious crop of grass. The bottom of the river channel from this island upwards to Ballyheady is composed of limestone shingle and gravel, except in a few instances when the clay comes in.

At the shoal or ford, a short distance up from the island, between Augharaskilly and Lecharrownahone, the bottom is composed of hard gravel and large masses of detached limestone. A short way above this shoal the river is seven or eight feet deep, but soon becomes shallow, and the stream is divided by numerous islands covered with willows, rushes, flaggers, &c.; the banks, especially on the north side, are low, broken, and their produce is of little or no value.

Between the townlands of Cormeen and Killeragh there is a ford, used by the inhabitants of the former townland for passing to the large bog on the south side of the river. To attempt to describe the obstructions here minutely, would only be to multiply repetitions of shoals, islands, streams, willows, &c., I therefore omit doing so.

From the farm-house of Cormeen up to Bellyheady Bridge, there is a great extent of valuable meadow land on both sides of the river, but so little elevated above the general level of the water-surface, that a very small rise in the river destroys its produce. Here the river deepens to eight feet, except at the shoals near Ballyheady Bridge; this bridge consists of eight unequal arches, the largest next the south bank; they diminish in size towards the north, on which side the two extreme arches are at a considerable distance from the other six, the piers of which are of an extraordinary thickness.

Above the bridge there is an eel-weir extending quite across the river; it is built of sandstone boulders, with the exception of a few limestone flags for coping; it has two eyes or fishing gates, separated by an island formed of rubble stones, on which a watch-house has been built; the weir is constructed on a ridge of hard limestone shingle, and boulders cemented together by a whitish clay. In the north bank, which is precipitous, this earth is so compact as to give considerable resistance to the jumper in boring. From the numerous indications in every part of this shoal, and the fact that the high land on the north rests upon rock, there is sufficient evidence that the solid rock is not at any great depth below the surface, but only one shaft or boring, owing to the hardness of the strata, did actually reach it; the two eyes of the eel-weir referred to are only 13 feet wide, and these with an opening or gap in the north wing of the weir, about six feet in breadth, supply all the passage left to the water until it has risen over the top of the weir, which stands generally about two feet above summer water. The floods meeting with such a powerful obstruction in their downward progress are necessarily raised to a great height and overflow the lands above Ballyheady Bridge to a considerable extent. A little to the west of Ballybeady House there are many large and powerful springs, evidently rising through carboniferous limestone.

Ascending from this place, the river is wide and deep for upwards of a mile, flowing through bog. The valley opens out on the north side, leaving a large extent of low bottom partially reclaimed, being principally moor covered with heath.

From this reach upwards, the banks are very low for a considerable distance inwards, and much broken; the water is shoal, and flows over a blue clay bottom mixed with gravel and boulders.

The river channel retains the same characteristics upwards to the western extremity of the narrow valley formed by the high land approaching on each side of the river, in the townlands of Killynaskeelan and Coologue. Here on the south side of the river in the

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former townland there is a large quarry, and the limestone is open to the day along the verge of the river; on the north or Coologue side it is not so visible; it runs obliquely across the river from north-west to south-east; it is more extensive on the south side, measured parallel to the centre of the river, than on the north, the average length being about 275 feet. Through the large meadow in the townland of Coologue, the river is from 16 to 20 feet deep, and the bottom soft; the surface of the meadow is but a little above the summer water, the drains always full, and the soil soft and spongy.

The next place in the ascent demanding particular notice is Skeeland ford or shoal; here the river is of great width, and the depth trifling; its course is very tortuous, and numerous small islands divide the stream into several channels. The river is crossed by two lines of stepping-stones, and the materials composing its bed are sand, gravel, and clay, and towards the upper end of the shoal, near Coologue Lough, masses of detached limestone abound. The water deepens gradually into the lough, and at the distance of 100 feet from the shore it suddenly attains a depth of 12 or 14 feet.

Coologue Lough is the lowest of the great chain of lakes which form so useful a recipient for the surplus waters of the middle district.

These lakes become an important and highly interesting feature in the character of the Woodford River. The greater part of the catchment basin is situated on the sloping sides of the great mountain range, forming the northern boundary of the district. The numerous tributaries having their source in this elevated locality send down their supplies during the wet season with great rapidity and force, until they discharge into these their natural compensators, which when adjusted and rendered capable of conserving the waters of those violent floods so as to pass them off with more uniformity (at the discharging channel of Lough Keelan), an important advance will have been made towards the establishing a judicious system for the reclamation of the flooded lands of a large division of the district.

Coologue Lough is not of great depth through that part which is in the line of the current, and its connexion with Derrycassin Lough is by an artificial cut, which in summer does not hold more than about seven feet of water.

Derrycassin Lough is very deep, its bottom being upwards of 20 feet below the level of the surface of water in Lough Erne in summer. It is connected with Ballymagauran Lough by a tortuous strait, usually known as the Srurah River, of very variable depth and width. At the point where it joins Ballymagauran Lough it is shoal; its greatest depth in the line of the channel is under seven feet. This last lough is connected with Garadice Lough by a short river-course, presenting very dissimilar features; in some places it is shallow, in others deep; in some narrow, and in others of great width; it flows over a diversity of strata, and is very crooked.

At Woodford there is an eel-weir, embracing the entire width of the river, and having only two eyes or fishing gates, together but 17 feet in width; through these eyes the whole of the water from Garadice Lough must pass, until from its detention it rises and overflows the stone walls of the weir, which stand about two feet above summer water. A little above this weir the rock is met at no great depth, and the river increases in breadth until it has the appearance of a lake, it then suddenly narrows at Ballinacor Bridge, where it runs over a ledge of limestone rock.

This bridge consists of nine arches of unequal dimensions, very much rent, and the foundations of the piers are greatly dilapidated; altogether it was originally of inferior workmanship, and is now in a very ruinous condition; the present depth of water under the bridge is only about one foot six inches. A short distance above this bridge is the entrance into Garadice Lough, which is much the largest of the chain referred to, and of great depth, in many places 46 feet.

The superficial area of these loughs, including the connecting straits or short rivers, is in summer, according to the Ordnance Survey, 1,470 statute acres, and the catchment basin which supplies them has by computation an area of 88,505 acres; therefore the reservoir (as has been already stated) is about one-sixtieth of the catchment basin in superficial extent.

The River Blackwater enters at a very acute angle the Woodford or Gore's River, opposite the Woodford demesne. Here the river is very contracted in its dimensions, and greatly obstructed by shoals and various other impediments, added to by the acute angle which is formed at its confluence with the Blackwater; the consequence is, that during floods the immense body of water discharged by the Blackwater meeting the accumulated waters from Garadice Lough at this point, they rise to a great height, and the Blackwater being thrown back by the force of the flood in the lough, spreads over the extensive lands of Ballymagauran, Killyran, Kilmacreevy, and Drumreilly, submerging periodically these valuable callows to the depth of several feet.

The peculiar character of the Blackwater increases these evils: the great elevation of the upper part of this division, where the small streams which constitute the river have their source, sends down the rain water on the valleys with great rapidity, and as the channels here are inadequate to the free discharge of the waters, the floods rise even at times without opposition from the Woodford River, and destroy the crops of the adjoining lands to a great extent.

The bridges that pass the Blackwater and stream from Killyran under the public road are very unfavourably circumstanced. If the aggregate width of the arches were properly disposed of, the waterway would be sufficient; but as it is, they are placed at unequal distances over an extent of 226 feet, with channels leading to them much too small and greatly obstructed, and the long line of blank wall intervening between them repels the water during floods, and raises the head to such a dangerous height, that it was deemed

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necessary for safety to make two large openings in the parapets or fence walls of the causeway, to allow the flood water a free passage when it rises to the level of the road.

From this bridge upwards through the meadows, to the narrow valley or pass between the high lands of Ballymagauran and Killyran, the river-course is very crooked and greatly obstructed. The valuable bottoms are wet and swampy, and produce nothing but inferior grasses.

The pass above referred to is narrow, and the channel of the river composed of gravel, clay, and boulders; above this place the channel becomes gradually deeper, but increases very little in width. About seven or eight years ago the proprietors of the land scoured and improved the river channel from hence to the townland of Boley; it has been much straightened; but the limited capacity given to it, especially at the bottom, has destroyed much of its efficiency. In many places the weight of the excavated materials has pressed in the sides and greatly narrowed the channel, originally much too small to pass the flood waters.

Between Killywillin and Killryan there is a timber footbridge and a ford; just above the bridge an eel-weir has been constructed of stakes and hurdles. At the ford two new abutments have been built of stone, apparently to be covered with a timber roadway of sufficient width for an occupation bridge.

Below the confluence of the Bellaboy River with the Blackwater its course is more tortuous, the banks perpendicular or undermined so far down as in many places to cause slips, which greatly obstruct the waterway. At this junction the Blackwater turns suddenly to the westward and forms a sharp and inconvenient bend, which has the effect of forcing the flood water almost directly against the current of the Bellaboy River. The depth of the channel below the general surface of the meadows is about 10 feet.

Near Blackwater Bridge there are the remains of a mill, the head-race of which was taken from the Blackwater above the bridge. This bridge, which is constructed of bad materials and of very inferior workmanship, has arches of 13 feet span each, so injudiciously placed, that the stream meets them obliquely; a gravel bank has therefore been formed under and down-stream of the west arch. The floods flow over the public road to the west of the bridge at such a depth as to endanger the lives of passengers, several instances being on record of travellers being swept from the road into the meadow below, and only saved by great exertion.

Immediately above the bridge the river makes a very objectionable turn, and for a considerable distance the sectional area is small; the rise of the flood over the surface generally is about two feet.

Between Blackwater Bridge and Ballymagirril Ford there are three horse-shoe-shaped turns and several sharps, which greatly impede the course of the stream. At the cottages in Strandarragh there is a shoal and other obstructions created by stepping-stones, and above this place there are several other shoals, at all of which the water runs over a gravel bottom.

In Bellaleenan and Ballymagirril several attempts have been made to embank the river, but very inefficiently; the valley narrows at the ford, and stepping-stones are placed across it, connecting those townlands. The bottom throughout this reach is hard gravel; above this ford the valley partially opens out for some distance, but the fall in the stream here is very considerable. At the upper end of this extension of the valley the river is formed into two branches, beyond which it is not of consequence to go for the present purpose.

It is now necessary to return to the river coming from Templeport and Bellaboy Loughs above referred to. At the junction of this river with the Blackwater, as has been stated, the conflict between the opposing streams is very prejudicial, especially in flooding the meadows near the loughs; the power of the Blackwater being so much greater, its influence is perceptible above the loughs. This river soon divides, one branch becoming the drain of Templeport Lough, and the other, which is the most important of the two, is the discharging conduit for the Bellaboy, Lakefield, Bunnesky, and Brackley Loughs. The three former are connected by short drains, and differ in the level of their surfaces about three feet. Bunnesky and Lakefield, being at a higher level than Bellaboy, send down their waters into it, and aid the Baurboy River, raising it to a great height, and the discharge being, as above stated, opposed by the Blackwater, it floods all the bottoms in its neighbourhood. Bunnesky is the largest of the loughs; but being so much above the level of the others, it affords no assistance as a reservoir.

The river-course from Bellaboy Lough upwards is in a very neglected condition—very deficient in capacity; it is the cause of flooding a great extent of very valuable meadow land.

The corn mill at Baunboy is a very imperfect one, although much benefit is derived from it by the neighbourhood; it may, however, be greatly improved at small expense; the occupied fall or power drives only one pair of stones. There is a small tuck mill adjoining the corn mill, which receives its water from the same head.

The river and mill-race from the mill to the lough, the latter of which, from being imperfectly constructed, is highly injurious to the adjacent lands. The river-course is nearly choked up, and there is no weir where the mill-race apparently leaves the river, the only substitute being a gap in the sod bank to allow the surplus water to escape. The surface of water in the river from this point to the lough is generally 12 inches above the adjoining meadows, being retained by embankments standing but a few inches higher, and which are overtopped by every small rise of flood, and the meadows consequently overflowed.

The river is attempted to be passed under the public road by an arch of six feet span and three and a half feet high from the bottom of the river-course; in consequence, during the floods, the public road is covered for several hundred yards on each side of the bridge.

The surface of Brackley Lough contains 351 statute acres, and has a catchment of considerable extent. The range of its surface between summer and winter levels is about two feet, by which large tracts of meadow land on its margin are liable to floods.

The Woodford river properly terminates at Garadice Lough, and the river which discharges the surplus water of the upper part of the district into it is called the Yellow River. This river enters the lough nearly at its extreme upper or western end, at a place called Camogue, where it is the boundary between Boeshill and Carrickmakeegan.

The lough maintains its depth quite up into the river-channel; here the stream makes one of those apparently unnecessary circuitous turns found in many of our flats under similar circumstances; the cause is, by the deposition of alluvion in certain positions, to all appearances by laws the most arbitrary.

The bottom of the river is generally formed of gravel, rising gradually up to Derrygoan Bridge; the banks are bog, and the surface low and subject to frequent destructive overflowings; a large portion of the south bank is a turbary, partially cut away.

Derrygoan Bridge consists of one 35-feet arch, and at the distance of 36 feet southward there is an auxiliary or flood arch of 15 feet span.

The character of the present channel above the bridge is little different in either form or strata from that below the bridge; about 30 chains upwards from the bridge the stream from Drumconra Lough enters the river. The surface of this lough in summer stands about three feet higher than Garadice Lough.

On the north side of the river, and about 33 chains higher up, is the confluence of the stream flowing from Ardmeenan Lough; the surface of this lough is so near the level of the summer water in the river at the confluence, that on the least rise of the floods the water flows up into the lough and covers a great extent of meadow land. Attempts have been made here and at several other places in the neighbourhood to prevent the ascent of the floods by self-acting sluices, but being ill-designed and inefficiently executed, they produce little benefit.

The valley at Riverdale is narrow; Aghoo Bridge consists of two segmental arches of 21 feet span each. Above Aghoo Bridge the channel of the river is much contracted and greatly obstructed by willows, &c. As the valley opens out and the holms become more extensive in the townland of Aghoo West, the river becomes more serpentine and irregular, especially in its width; farther to the northward or up-stream, the valley closes in, leaving but little space between the river and the abrupt ascent of the upland, consequently, the stream having less space to act in, its course is straighter generally, up to Ballinamore Bridge.

It is now necessary to return to the stream flowing from Edentinny through Ardrum bottoms; this stream has its chief supplies from several permanent loughs as well as turloughs, situated considerably higher up than Edentinny, where the principal visible source of this stream appears. It flows in a large volume from underneath the face of a perpendicular limestone rock in the townland of Langstones, and immediately adjoining the village of Edentinny.

There are also several minor springs in the swampy bottoms to the east of these rocks, which add considerably to the magnitude of the stream. The surface is much broken, and two small loughs or pools are formed; and in the neighbourhood of these loughs the surface of the meadows is lower than on the banks of the Yellow River, where the stream joins it.

Between Drumraine and Ordrum there is a ford at which the limestone rock approaches within a short distance of the stream; the entire of these extensive bottoms are submerged to the depth of several feet by the floods of the Yellow River; for although the quantity of water discharged by the springs is much greater in winter than in summer, yet the meadows would suffer no damage if the floods of the Yellow River were confined within the limits of its own channel.

At the town of Ballinamore, and just below the new bridge, the Foghera River has its confluence with the Yellow River; it flows through the town, and the main street is carried over it by a bridge of two arches. The entire course of this river, from the town to Dromore Lough, is choked up, very tortuous, and in its best parts quite inadequate to contain the flood-water; it is the main discharging drain of a large district, and such is its insufficient and neglected state, that during every heavy fall of rain a large extent of meadow and arable land is flooded, to the great injury of the hay and corn crops.

At Ballinamore the valley of the Yellow River becomes narrow, and remains so to the corn mill, about one quarter of a mile above the bridge.

The water-wheel of this mill is 19 feet in diameter and three feet six inches in breadth.

In the centre of the river, there is built longitudinally a wall eight feet in thickness, between which, and both sides of the river, there are sluices for the purpose of creating a head of water for the mill.

The total width of waterway of these sluice gates is 27 feet, and they give the miller a power of detaining the flood-water at his pleasure. The capacity of these sluices when raised to their greatest height is unequal to the free discharge of the water in high floods, and it being arrested in its progress to the valleys and lakes below, it accumulates in immense quantity a short distance above the mill, where the valley opens out to a considerable width, and in its area includes George's Lough, of about 35 acres in extent. When the influence of the obstruction at the mill extends backwards to this valley, the flood-water flows towards George's Lough, which is about 120 perches north of the river; and when its

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capacity for receiving the flood-water is overpowered, the entire length of the low bottoms are submerged, also covering the public road from Castlerogy, and thereby compelling travellers on this road to go a circuit of several miles, by Ballyduff and Edentinny, to their great inconvenience. In fact, George's Lough, and the entire of these low bottoms are, by the sluices at the mill, converted into a regulating basin, in which the flood-water of the Yellow River is received, and passed off in such quantity as the sluices will admit of, under the control of the miller.

The Yellow River above this point, assumes the character of a rapid destructive mountain torrent. It has its source in the mountain range before alluded to, at a great elevation above the subjacent valleys, and sends down its floods with such rapidity and force, as to prove very destructive to the meadow lands and their produce.

The high road from Aughacashel to Ballinamore crosses by an insufficient bridge of three arches, the aggregate spans of which equal 27 feet, the river which flows out of St. John's Lough, in the townland of Ballyduff. There is, in addition to these, an arch of 13 feet span, which was used for conveying water to the bleach mill; but except during the very highest floods it is not available for the discharge of the waters. Before we reach the bridge, we meet the remains of the Ballyduff corn mill and sluice gates, all in a ruinous state; still the sluice gates are occasionally used as eel-weirs.

St. John's Lough extends from Ballyduff Bridge, in the line of the navigable course, rather more than two statute miles in length; this lough is divided into three broad reaches, separated by narrow straits or passes, as they are called. The first of these, "Derrymacoffin Pass," is about 50 perches in length, and at its narrowest part, about 100 feet in breadth; across this pass there is almost a solid causeway raised above the present summer water, causing a great obstruction to the discharge of the flood-waters, having but two openings, one in the centre, 14 feet 6 inches in width, the other near one end, of but 4 feet in width; this causeway in time of flood acts as a penn-weir, over which the water tumbles until the lower or northern portion of the lake is raised to the level of the middle and upper reaches; the injurious effect of this is evident upon the low-lands around the southern end of these waters.

"Muckross Pass" divides the middle and southern reaches; its least breadth is about 160 feet, the northern is the deepest, and the southern the shallowest reach of St. John's; the latter is generally from 4 to 8 feet in depth, but in some cases it extends to 15 feet.

The shallowness of this portion of St. John's Lough is the natural consequence of its being the recipient of the Aughacashlane River, having its source in the Slieve-an-Erin mountains. During floods this turbulent stream carries down a large quantity of sand and gravel, which is deposited in the quiet waters of the lough, lessening annually the depth in the part where it enters.

With the exception of the southern end, the shores of this lough are precipitous, and consist of gravel and shingle almost irreclaimable; the bottom of this lough is principally composed of soft mud.

Connected with St. John's Lough there are two small loughs, "Mordriken and Marrave;" they are separated from St. John's Lough by patches of marshy land. All the three lakes stand upon the same level.

As these lakes are generally surrounded by high hills that dip rapidly to the water's edge, there is very little flooded land along their shores.

Including Loughs "Mordriken and Marrave," the area of these lakes is about 580 statute acres. Where the Aughacashlane enters, the bed of the river is now in many places very little below the level of the lands adjoining; embankments have been constructed to confine the waters to the channel, but these only mitigate the evil, and if the bed of the river be not regulated, it is probable that eventually it will be raised above the level of the adjoining lands, and after doing much mischief, the stream change its course into some more favourable position. Such is the impetuosity with which the waters rush down from the mountain during heavy rains. that they flow over the low ground at the barony bridge and back into Lough Scur, prejudicing to a great extent the low lands around the lake.

The whole distance from St. John's Lough to Lough Marrave is about two miles; out of the latter there is a small stream called the "Canal," which flows to the barony bridge, then turns along the road, under which it passes, and joins the Aughacashlane, about 210 perches from Lough Marrave.

This canal has lately been deepened by presentment, and although the extent of improvement was necessarily limited, the good resulting has already been very apparent.

Lough Marrave may be looked upon as a continuation of Lough Scur, as they are upon the same level, and the channel connecting them (which is about half a mile in length) averages 150 feet in breadth, with six feet depth of water, with a soft mud bottom, in which are met large timber logs of oak and pine.

Lough Scur in the line proposed to be navigated is deep, and its length from Lough Marrave to where the still water canal departs from it, near Letterfine, is about two miles. The bottom is generally soft mud, and in some places compact peat. The shallowest portion of Lough Scur is the northern reach, between Driny and Drumcong; this evidently arises from the large quantity of detritus carried into it by a mountain stream flowing by Annadale. Nearly in the direct line of the navigation, and of the Roscarbon shoal, there is an insulated rock almost level with the summer water surface; this is nearly circular, and not more than 10 or 15 feet across. At the distance of 30 or 40 feet all round it there is in summer from 10 to 12 feet of water.

Close to Lough Scur there are two other lakes, Carrickaport and Keshacarrigan, or Laheen Lough; the latter lies upon the north of the village of Keshacarrigan, and is connected

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nected with Lough Scur by a channel about a quarter of a mile in length, and about 20 feet in width; this lake and Lough Scur are upon the same level; its area is about 124 statute acres.

Carrickaport Lough is at a level about one foot higher than Lough Scur; there is a small stream between them, about a quarter of a mile in length. This lake is surrounded by high land, and its area is about 127 statute acres.

The distance from Lough Scur to Drumleague Lough, in the line of the channel for the canal, is principally composed of cut-away bog, with rock very near the surface.

Drumleague Lough is half a mile in length, and about one-eighth of a mile in average breadth. Its greatest depth is 20 feet, and the bottom is composed of very soft mud.

The shores of Drumleague Lough are flat; but the quantity of land flooded is very trifling.

From Drumleague Lough a small stream flows into Lough Conway, a very small lake about a quarter of a mile distant, and which is kept at its present level by a sluice for the purpose of reserving a supply for the grist mill.

This mill is on the north of the post road from Ballinamore to Carrick-on-Shannon, and is about three quarters of a mile from Drumleague Lough.

The great mass of the surplus waters of the basin in which Lough Scur is situated, will, after the completion of the proposed works, be diverted eastward into Lough Erne; a very small channel will therefore suffice for discharging what waters may arise in the valley, or in the Kilclare stream, where the construction of the canal shall interfere with the existing watercourse.

From Kilclare mill, the stream before adverted to runs westward, in rather a direct course, and down the narrow valley of which it is now the only occupant. It is intended to carry the still-water portion of the line of the Junction Navigation from its summit at Lough Scur, to its terminus in the River Shannon, at the town of Leitrim.

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Detailed Description of the Proposed Works and Improvements.

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For the purposes of navigation, a channel is proposed to be cut in the bed of the river, through the shoal at the entrance into Lough Erne, to be 22 feet in breadth at bottom, and sunk to a level 14 feet above datum, or six feet under low summer water in the lough. It is also proposed to follow the same course at Killynick, Corraback, Corgreagh, Aghalane, and Drumettagh shoals. Three piers of Aghalane Bridge are proposed to be underpinned so as to allow the intended channel to be sunk to the necessary depth.

By the proposed deepening of these shoals, a navigable channel six feet in depth, and of one uniform level from Lough Erne to Caroul shoal will be obtained. At the lower end of Caroul shoal, the first lock and regulating weir become necessary to overcome the ascent. It is designed to construct this lock at the lower end of the shoal, in the townland of Drumettagh, county Fermanagh; and as it is proposed to lower the surface of the summer water at the upper end of the shoal to 26 feet above datum, about three feet below the present low summer water, the lift of the lock will be but six feet. It is also proposed to make a short cut at a favourable turn in the river, and in this cut to place the lock. A small severance will thus be created on the eastern side of the river, which will afford a favourable position for mill-sites. The regulating weir will extend from this severance to the west side of the river, a little below the site of the old lock. The length of the weir to be 240 feet. The maximum quantity of water to be discharged by this weir has been calculated at nearly 90,000 cubic feet per minute, therefore the greatest height to which the flood water would rise on its apex will be under 18 inches.

From the upper end of the side cut and weir basin, the bottom of the river is carried at a uniform level (20 feet above datum) throughout the shoal, and with a bottom breadth of 60 feet.

The river which enters the Woodford River at Caroul, between the townlands of Corry and Derryhooly, county Fermanagh, will require an extensive improvement. It is proposed to straighten its course and enlarge the capacity of its channel, so as to contain within its banks the flood water descending from Slieve Rushen, for a distance of 1,280 perches from its entrance at Caroul. By this course the floods will be carried down to the Woodford River, with sufficient celerity to prevent the meadow lands being overflowed, and thereby relieve them from their destructive effects.

It has been already stated that the proposed summer water from Caroul lock to Ballyconnell lock will be three feet lower than the present low summer water at the upper end of Caroul shoal. By this reduction of the level of the water's surface in summer, and the provision made by the regulating weir at Caroul lock, which will limit the rise of the greatest floods to about 18 inches, ample fall will be afforded to the land drains and rivulets throughout the extensive low lands in this part of the district, and a perfect system of thorough drainage can be brought into operation.

It is proposed to straighten the river course, which at present is very crooked, by two rather extensive new cuts in the townlands of Dernagore, Cloncoohy, and Carrickalese; the first of these cuts is across the neck of a peninsula in the townland of Dernagore, by which a large inconvenient bend in the river will be cut off, and a direct entrance into Cloncoohy Lough opened up.

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The second is from Cloncoohy Lough across Carrickalese bog, and enters the Woodford River at the north-east angle of Ballyconnell demesne, by which the long winding course of the river, round the south side of Cloncoohy townland, will be avoided. The distance of these cuts is only about one-half of that by the present river course. The excavation is all in bog, except a small quantity of gravel in the bottom reach of Carrickalese bog. To scour and improve the course of the river from Cloncoohy Lough to the gravel shoal at the issue of the stream from Drumderg Lough, and to enlarge the channel through the gravel shoal, a short distance above the lough, so as to facilitate the flow of waters into it.

A short distance above the termination of Carrickalese cut, where the river is divided by an island, it is proposed to carry the navigation through the northern branch, being the most direct, and to follow the main course from the island to the entrance of the lock at Ballyconnell, removing the existing obstructions, and straightening the channel as far as circumstances warrant, by alternate cuttings on the right and left banks of the river. The material composing the bed of the channel from Carrickalese cut to Ballyconnell is clay and gravel.

The proposed lowering of the water surface in this reach of the river admits of the level at which it will be placed being carried back to Ballyconnell mill, and by the increase thus given to the fall, the effective power of the mill will be more than doubled.

It is proposed to pass the Ballyconnell regulating weir by a side cut and lock, the entrance to which will be near the site of the old bleach mill; the lift of this lock will be 10 feet. The side cut above the lock will enter the present head race of the mill, which it is proposed to enlarge and modify in such a way as to answer efficiently the combined purposes of mill supply, and navigable water-course.

It is further proposed to retain the present site of the weir, and rebuild it with superior materials on improved principles of construction; the length of the discharging line of this weir will be 300 feet, by which the height of the water on its apex will not exceed 15 inches during the time of the highest floods. By the proposed level of the upper sill of the lock here, the level of the summer water will be reduced 12 inches below the present average summer water above the weir, which will naturally assist in relieving the low meadow land on the margin of the river up-stream from Ballyconnell.

In this reach of the river, it is proposed to continue the navigation channel along the north or town side of the river and weir basin, up to the bridge. The shoal at this bridge will have to be entirely removed to the depth of six inches below the sill of the lock; and for navigation purposes, it will be necessary to take down the north arch and the northern abutment, and rebuild them, giving such increased span to the arch as will be sufficient for the free passing of first-class trade and steam boats. To effect this, it will be necessary to support the roadway on cast-iron beams, as there is not sufficient headway to allow for a stone arch, without raising the carriage way to an inconvenient height. The two piers and south abutment to be underpinned, and the navigation channel continued on the north side, until the deep water is attained.

The Crooked River it is proposed to treat in the same way as the river which enters at Caroul shoal, that is, to straighten and enlarge its course for about 480 perches up from the Woodford River, to enable it to discharge the sudden mountain floods without injury to the adjoining land. It is also proposed to change its present entrance into the Woodford River, by diverting its course from its usual track, a short distance below the new road, between Ballyconnell and Ballinamore, and oblige it to enter the river at a point lower down stream.

Through the townlands of Agharaskilly, Lecharrownahone, Conneen, Killerah and Ballaheady, the river will require deepening and straightening, the amount of which may be ascertained by reference to the sections and plans. The old eel-weir at Ballybeady must be entirely removed, and the bridge underpinned. At this place it is proposed to change the form of channel heretofore recommended, it being desirable that a uniform level should be obtained for the bottom of the course from Ballyconnell to Skelanford, without the intervention of a lock, which the configuration of the surface of the ground would seem to require; and as the cutting suddenly increases in depth at Ballaheady, the bottom it is intended shall be narrowed (to save expense) to the ordinary breadth of the navigation cuts, viz., 22 feet, but without risk of the floods rising over the surface of the adjacent land, as the sectional area of the channel itself will allow sufficient declivity in the surface of the water to produce a velocity equal to the required discharge without overtopping the river banks. This system will afford effectual relief to all the low meadow land throughout this reach, which is now so injuriously affected by floods. The rock-cutting at Kittynaskelan will no doubt be increased, but this will be more than compensated for by the saving of the lock adverted to.

The next rise in the river to be overcome by a lock and weir is at the sudden turn of the river around the high land at the extreme south-west point of the townland of Coologue, a short distance below the lough of that name. The lift of this lock will be variable, so as to answer the changeable level of the water in the several loughs in which it is proposed to conserve the flood-water as stated in the Report, and deliver them out in regulated quantities. The weir will therefore be of a peculiar construction, as by its means the rate of discharge from the reservoir will have to be measured.

It has been already stated in the Report, that the principle to be adopted in this division of the measure is to make the chain of lakes enumerated a series of compensating reservoirs, in which all the flood-waters of the upper portion of the district will be received and conserved to an extent that will admit of their being discharged with such regularity as to warrant us in lessening the capacity, and consequently the cost, of the drain to be provided for carrying them when delivered, below the regulating weir at Skelan.

The shoals in the three short straits connecting the lower lakes are to be removed, and the obstructions in Gore's River, the eel-weir at Woodford, and the rock at Ballinacor.

It would be a public advantage to demolish the present dilapidated bridge at Ballinacor; but for the purpose of this measure, the removal of two arches and replacing them by one of suitable span, and some underpinning will be sufficient.

It has been stated that the River Blackwater enters Gore's River at a place totally inadequate for its reception without very injurious consequences; it therefore becomes necessary to change the course of this river from the point where it issues from the narrow pass between the high lands of Ballymagauran and Killyran, the new channel to be carried along the meadows at the foot of the high ground of the former townland, and near to the hamlet, making a bold sweep at the corner of the gardens, and be passed under the public road by a new bridge with an arch of 40 feet span, and here enter the upper end of Ballymagauran Lough. By this change the old river-course will be left to the occupation of the stream from Killyran and Glebe Loughs, and the floods of the Blackwater entering the lough at such a distance from the line of navigation would diffuse themselves over its surface without any injurious consequences.

From the above-named pass to the upper end of the shoal in Ballymagirril, it is proposed to enlarge, straighten, and improve the river-course in such a manner as to secure the free discharge of the floods without injury to the lands.

Similar treatment becomes necessary in improving the river from Bellahoy Lough and the stream from Templeport Lough. It is proposed to cut down the channels connecting Bellahoy, Lakefield, and Bunnesky Loughs, so as to reduce them to one level, that they may be united in forming another reservoir for the flood waters of this district during the presence of high floods in the Blackwater.

The river-course from Bellahoy Lough to Baunboy, and thence to the mill-race weir, it is proposed to scour and improve. From the last-mentioned point to Brackley Lough it is proposed to make a new river-course separate from the head-race of the mill, and appropriate the present channel to the mill uses, and to construct a stone weir so as to regulate the water of the lough to such a height as will relieve the lands without prejudice to the mill.

A new bridge for the public road will have to be constructed here, as the present one is quite insufficient.

It has been stated in the general description that the Yellow River at its entrance into Garadice Lough makes a very inconvenient turn; it is proposed to remedy this by a new cut directly in a line with the river above the turn, and to deepen the shoal from thence into the lough.

It is further proposed to carry the level of Garadice Lough up to Aghoo, where the No. 4 lock and weir are to be placed. The shoals and sharps in the river-course to be removed to the prescribed dimensions, and the channels from Drumcoura and Ardmena Loughs to be scoured.

Derrygoan Bridge not having sufficient waterway as it now is, it is proposed to add another arch to that now standing, and underpin the present abutments.

The lift of the lock at Aghoo is 6 feet, and the length of the regulating weir 200 feet. It will be recollected that the surface of the water in these loughs will be variable, therefore the lift of the lock at Aghoo will vary with the rise of the floods.

The bed of the navigation reach, from this lough to that next below Ballinamore, is proposed to be made one uniform level. The material to be removed, to give the channel the required capacity and level, is mud and gravel. Several sharp turns will also have to be cut off by new channels, and the course generally straightened.

Aghoo Bridge being too limited in waterway, it is proposed to add another arch to it on the south side, similar to that proposed for Ballyconnell, as there is in it also a deficiency of height for navigation purposes.

It is intended to scour up and enlarge the course of the stream flowing from the fountain near Edentinny, and to erect an occupation bridge at the ford between Ardrum and Drumraine.

The Aghadark, or Lower Ballinamore lock and weir are to be of the same dimensions as these at Aghoo, with the exception that it is proposed to make the weir but 150 feet instead of 200 feet in length.

To avoid the extremely inconvenient turn below Ballinamore Bridge, it is proposed to cut a new navigation channel, commencing opposite the police barrack, and passing by a bold sweep between the barrack and the bridge, to terminate with the Upper Ballinamore lock, a little below the mill. It is advisable not again to communicate with the river until the line has passed this lock. By this cut several difficulties are surmounted; not only the sharp turn at the confluence of the Foghera and Yellow River is avoided, but the bridge at Ballinamore, which is but recently erected, is left untouched, and the declivity in the bed of the present river-course allowed to remain as it is, requiring but little improvement in some few places.

The public road will be carried over the proposed cut by an arch of sufficient span to admit a towing-path on the western side.

The channel of the Foghera River from Ballinamore to Dromore Lough requires to be straightened, scoured, and improved, so as to relieve the meadow land from the destructive effects of the floods. This will not be difficult of execution, as there is naturally ample fall in the river.

In addition to the new navigation cut at Ballinamore, it is proposed to excavate a channel

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from above the upper lock nearly in the line of the old mill-race, in which a partial attempt had been made to convey the water from the part of the river above the intended lock to the lower side of the public road, passing the National School, so as to create in this very convenient locality water power of considerable efficiency.

And as the much superior mill site here, added to that immediately below it at Aghadark, will be fully equal to the business of the country, it is proposed to remove the sluices of the present mill altogether, and to cut down the rock on which they stand, so as to give an ample passage to the pent-up waters, and entirely free the extensive tract of meadow and marsh lands in the up-stream valleys from the destructive floodings to which they are now subject.

The course of the small stream coming in from George's Lough requires scouring and improving, and some repairs to the culvert that passes it under the public road.

It is proposed to carry the bottom of the river-channel, from Ballinamore Lock to within a short distance of Ballyduff, on one level, which will lower the water so far below the general surface of the adjoining meadow lands as to afford at all times a sufficient fall to the land drains.

It is proposed to place the 7th lock and weir at the tail of the rocky shoal, which extends from the western mearing of Creevy townland into St. John's Lough, the river at this point being wide, affording ample room for weir basins, and a regulating weir of sufficient length The rise of the lock is to be 9½ feet.

It is proposed to concentrate the mill power at Ballyduff, at the old bleach mill, and remove the present sluices at the bridge, so as to throw the river open to the navigation. If the water power existing at this place be brought into useful operation, the tail-race from the old bleach mill can be extended on the south side of the river, and enter a short distance below the lock. By this means, a fall equal to the lift of the lock will be obtained at the site referred to (the old bleach mill).

It is proposed to remove the ruins of the corn mill altogether; to take down the centre part of the present bridge, and substitute an arch of a span and height suited to the purposes of the navigation. The bottom to be carried level into St. John's Lough.

The navigation, as will be perceived on reference to the map, leaves the Yellow River, and follows that flowing from St. John's Lough; and to prevent the destructive effects of the Yellow River on the meadow lands, both above and below the confluence, it is proposed to divert its course from a point a short distance above the eastern mearing of the townland of Kiltybardeen, into St. John's Lough, passing under the public road to Ballinamore, by a new bridge, and entering the lough to the west of Wood Island.

The present river-course, from the point of division to the present confluence, to be left to discharge the waters of its own immediate basin.

The proposed navigation channel to be carried through St. John's Lough, in the line marked on the map, and on sheet No. 24 Ordnance Map of Leitrim.

It is proposed that the future summer water in the lough shall be two feet lower than the present, and therefore a considerable amount of excavation will be required in deepening shoals, and removing other impediments.

It is also proposed to change the present embouchure of the Aghacashlane River, and give it a more direct entrance into the lough; and to remove the shoal, and carry the level from the lough up to the lock at Castlefore; improving and straightening the river-course.

The rise at Castlefore will require a double lock; and it is proposed to continue a separate cut from the navigation into Lough Marrave.

The river-course being separated from the navigation, will ascend at a suitable gradient up to the rock near the barony bridge, when the rise will be much quicker; and from thence pass, by a new course, across the flat meadow land, and under the Castlefore road join the present course of the Castlefore River, which must be enlarged and straightened to Lough Marrave.

In order to regulate the level of the upper chain of lakes, and maintain a controlling power over their waters, it is proposed to place a weir at the lower end of Lough Marrave, a little to the north of where the present river leaves it, of such dimensions and form as will effect the desired purpose.

It is proposed to reduce the present level of summer water two feet; and as the Loughs Scur, Carrickport, Keshcarrigan, and Marrave, constitute the summit supply for the locks on both sides, in the transit of the trade, it is designed to have a power of conserving two feet in depth of the surplus flood water all over their area (614 acres) and fixing the level of future floods at that of the present summer water.

It is also proposed to treat the Aghacashlane in the same manner as the Yellow River, by diverting its course across Annagh Bog, into Lough Scur, at the mearing between the townlands of Rossy and Driny, passing under the Castlefore road.

The navigation to proceed through Lough Scur, in the line described on the diagram map, and marked more particularly on sheet No. 24 Ordnance Map of Leitrim, removing the shoals and other impediments that present themselves, and to depart from the western end, at the north-east corner of Letterfine demesne, passing under the public road, by a new bridge, and entering Drumaleague Lough at its eastern end.

The shoals and other impediments to be removed; it is then proposed to continue the level of Lough Scur through the summit, lowering the water of Drumaleague Lough, and to cut through the limestone rock, in the townlands of Scrabhagh and Kilclaremore.

The first lock in the descent from the summit is intended to be a double lock, and it is proposed to construct a side weir, 150 feet in length, immediately above the lock, to aid the weir and river-course at Lough Marrave in the discharge of the surplus flood-water.

The corn-mill of Kilclare is of a very inferior class, but very useful to the inhabitants of the district; it is therefore proposed to improve it, by supplying it from the canal.

The stream or river flowing in the valley down to Leitrim is proposed to be diverted in several places, and carry it, either in the back drains or side ditches of the canal, as circumstances may direct.

The public road to Carrick-on-Shannon will cross the navigation by a new bridge, at the summit or ninth lock, and again at the twelfth lock, in the descent, and again at the fourteenth lock, in the townland of Newbrook.

Townland bridges will also be required at Mr. Dermott's houses, Newbrook and Sheafield, besides some occupation bridges, for the accommodation of the farmers.

The last or seventeenth lock in the descent, within a short distance of the Black Lough, in the townland of Killarcan, reaches the proposed level of the water in the Shannon. The navigation then enters the Black Lough, and the present river-course is proposed to be enlarged and straightened, from thence to the River Shannon, reconstructing Leitrim Bridge so as to adapt it to the purposes of the trade in the Junction navigation.

John MacMahon, C. E.

(A.)—DRAINAGE AND NAVIGATION COMBINED.

Grand Junction Canal District, Counties of Cavan, Fermanagh, and Leitrim.

ESTIMATE of the Cost of the proposed Works of DRAINAGES and NAVIGATION Combined.

	£.	s.	d.
Excavation in deepening and widening the Woodford and Yellow River channels, and in new cuts from Lough Erne to Lough Scur; and in proposed canal from Lough Scur to Leitrim, including the new cuts for diverting the course of the Yellow River into St. John's Lough, and the Aughacashlane River into Lough Scur - - - - - -	60,889	8	5
Scouring and improving channels of tributary rivers and drains, and making new ones in certain places on those tributaries - - -	3,984	13	3
Masonry in locks, new bridges, and weirs, and in underpinning and enlarging old bridges, repairing and building fence walls, culverts, and drains - - - - - - - - - - - -	31,800	–	–
Consequential damages - - - - - - - - - -	2,700	–	–
Preliminary surveys, valuations, plans, reports, estimates, &c. &c. - -	750	–	–
Advertisements, holding courts, and other preliminary proceedings -	150	–	–
	100,273	18	8
Contingencies, incidental expenses, superintendence, &c. at 10 per cent.	10,027	7	8
Gross Cost - - - £.	110,301	4	4

John MacMahon, C. E.

	£.	s.	d.
The cost of the navigation equals - - - - - - - - -	92,501	4	4
The cost of the drainage equals - - - - - - - - -	17,800	–	–
Probable Sum required for Interest on Money borrowed for carrying out Works:—			
£.30,000 for 3 years 40,000 2 years 40,000 1 year } at four per cent. per annum, amounts to - -	8,400	–	–

(B.)—NAVIGATION ALONE.

Junction Canal District, Counties of Cavan, Fermanagh, and Leitrim.

ESTIMATE of the Cost of the proposed WORKS.

	£.	s.	d.
Excavation in deepening and widening the Woodford and Yellow River channels, and in new cuts from Lough Erne to Lough Scur, and in proposed canal from Lough Scur to Leitrim - - - - - -	58,236	7	5
Masonry in locks, new bridges, and weirs, and in underpinning and enlarging old bridges, repairing and building fence walls, culverts, and drains - - - - - - - - - - - -	31,800	–	–
Consequential damages - - - - - - - - - -	2,700	–	–
Preliminary surveys, plans, reports, estimates, &c. &c. - - - - -	750	–	–
Advertisements, holding courts, and other preliminary proceedings -	150	–	–
	93,636	7	5
Contingencies, incidental expenses, superintendence, &c., at 10 per cent.	9,363	12	–
Gross Cost - - - £.	102,999	19	5

John MacMahon, C. E.

Appendix, No. 2.

(C.)—DRAINAGE ALONE.

Grand Junction Canal District, Counties of Cavan, Fermanagh, and Leitrim.

ESTIMATE of the Cost of the Proposed Works of DRAINAGE alone.

	£.	s.	d.
Excavation in deepening and widening the Woodford and Yellow River channels, and in new cuts from Lough Erne to Lough Scur, including the new cuts for diverting the course of the Yellow River into St. John's Lough, and the Aughacashlane River into Lough Scur - - - -	13,677	8	5
Scouring and improving channels of tributary rivers and drains, and making new ones in certain places - - - - - - - -	3,854	13	3
Masonry in new bridge at Ballymagauran, and new regulating weir at Skelan, and in the repairs and improvements of existing bridges, and the mill weir at Ballyconnell, and in culverts and drains - - - -	2,050	-	-
Consequential damages - - - - - - - - - - -	1,100	-	-
Preliminary surveys, valuations, plans, reports, estimates, &c. &c. - -	400	-	-
Advertisements, holding courts, and other preliminary proceedings -	70	-	-
	21,152	1	8
Contingencies, incidental expenses, superintendence, &c., at 10 per cent.	2,115	4	2
Gross Total - - - £.	23,267	5	10
Probable sum required for interest on money borrowed for carrying on the works, at 5 per cent., for two years - - - - - - -	1,800	-	-

John MacMahon, C.E.

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Appendix, No. 3.

EXTRACTS from the Traffic Report to the Shannon Commissioners, and from Tables annexed to that Document, showing the Extent of the Navigations, and the Names of the Principal Places which would be connected by Water, by the construction of the Junction Canal.

"IN fixing the limits of the portion of the country which I conceive would be benefited by the proposed canal, I have been chiefly guided by the consideration of what districts would make use of these navigations for the export of their produce, and the import of the necessary articles of commerce by the Ulster Canal to and from the ports of Belfast and Newry.

"The extent of country thus determined amounts to about 770 square miles. With respect to that portion of this district which adjoins the Shannon and Boyle Water, it is not intended to convey the idea that the whole of the traffic of this country would be carried on by this canal; but that this is the portion of country adjoining the Shannon which more than any other requires a water communication with the north of Ireland, would from its commercial relations with the North and with Scotland, carry on a larger proportion of traffic by the proposed navigation, and is consequently the most suitable in which to fix the terminus on the Shannon for such a canal.

"With respect to that portion of the country lying between the summit and the River Erne, it will, perhaps, be sufficient to state that the greater portion of its present traffic is carried on by carts, with the ports of Belfast and Newry; and that from Carrick-on-Shannon, Boyle, Drumshambo, and other places adjoining the Shannon, the greater portion of the butter and pigs and all the yarn is taken northwards.

"To Ballinamore, within 14 miles of the Shannon, even the heavy article of timber is frequently brought by land carriage from Newry and Belfast.

"From Mohill, the greater portion of the traffic would naturally be with Longford and Dublin; but the butter, yarn, and pigs would (as is now generally the case) be sent to Belfast and Newry.

"Boyle *, the chief town in the portion of the district west of the Shannon, and which is surrounded by some of the richest feeding land in Ireland, (called the plains of Boyle) carries on the greater portion of its trade with the port of Sligo, 20 miles distant, under all the disadvantageous circumstances of expensive land carriage, an inconvenient harbour, and heavy insurance, besides the risk and delay consequent on westerly winds.

"The contemplated improvement of the Boyle Water will bring the steam navigation of the Shannon within a mile and a half of the town of Boyle; the stream of traffic will consequently be diverted from Sligo, and although the distance to Dublin by the Shannon and Royal Canal will be seven or eight miles less than to Belfast by the proposed Junction and Ulster Canals,

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* Large flour and corn mills have been lately erected at Boyle, with extensive stores attached. I have ascertained that these mills are even already doing a considerable amount of business, and creating a great increase in the corn market of Boyle.

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Canals, it is presumed, that from the demand which exists in the north of Ireland* for the produce of Roscommon, and the relations established with Scotland, the greater portion of its produce would go northwards.

"Amongst the sources of traffic to such a navigation may be enumerated the following:—

"Coals from Arigna and other collieries in the neighbourhood of Lough Allen.

"There is at present a very considerable demand for these at Belturbet (in which there is a large distillery), and generally throughout the county of Cavan, owing to the greater portion of the bogs in that county being cut away. This trade is at present carried on by land carriage; from 12 *s.* to 14 *s.* carriage per ton being charged for about 25 or 30 miles.

"Iron from Arigna to the iron foundries at Belfast and the north of Ireland. It is to be hoped that the neglected state in which the Arigna works are at present placed will not be suffered to continue, and that so rich a source of profit and employment to the people will, ere long, have the benefit of being fully and fairly developed.

"There is also excellent clay for fire bricks and other purposes at Arigna, the manufacture of which, it is presumed, would be stimulated by the facilities for transport afforded by the canal.

"Fat cattle and sheep, including beef and pork for export, from Belfast, which is largely engaged in this trade, to supply which many portions of the district made accessible by the proposed canal are peculiarly fitted.

"The small town of Arvagh has a considerable pig market, and would derive much benefit in this trade by the proposed navigation.

"General agricultural produce.—Fully one half of the district delineated on the map would send the whole of its produce northward. Of the remainder, the greater portion of the butter, eggs, and hides, all the yarn, and a considerable portion of the wheat, oats, and barley, flour, and meal would be sent by the proposed canal."

In the Railway Commissioners' Report, (Appendix B, page 26,) it is stated that Belfast consumes more wheat than is grown in its neighbourhood, and even that at some periods wheat has been brought from London, and sold at a profit in Belfast. I have also ascertained that flour is frequently sent from Tullamore to Enniskillen. The benefit of opening a communication with the rich wheat lands along the Shannon will, under such circumstances, be evident.

Hand-spun yarn, the same Report states, is brought from Longford and Roscommon, by Dublin, and thence by sea to Belfast: this, therefore, would be another source of traffic to the proposed canal, and it may be fairly presumed that the increased stimulus now given to the linen trade in Belfast, will increase the demand, and consequently the growth of flax.

As a return trade, general merchandize, groceries, manufactured iron goods, linen, flaxseed, British coals, &c., will be brought from Belfast; and whisky, porter, and beer, from Enniskillen, Clones, and Belturbet.

Amongst the sources of more general and extended traffic may be mentioned:—

Timber and other articles of American produce, which, owing to the facilities that will be afforded by steam navigation, upon the completion of the proposed improvements of the Shannon, and the established trade which Limerick has with America, will, most probably, be supplied from that port, through the proposed junction canal, to the counties of Leitrim, Cavan, and Fermanagh.

Slates and marble from Killaloe, and, as before mentioned, wheat and flour from Limerick and other rich districts in the south and central portion of Ireland, may be expected to be sent through this canal to the north.

In treating this portion of the subject, upon which I have been directed to report, I have necessarily been obliged to speak in very general terms, as the facts which I have obtained during the short time devoted to the inquiry are insufficient to found precise calculations upon †.

"Those facts show, as must be expected, a great inferiority and a great additional expense in the present mode of carrying on the traffic of the country by land carriage, as compared with the efficiency and cheapness of connected water communication to the most advantageous outports of the district concerned."

Without going into detail on the subject in this preliminary Report, it will perhaps be sufficient to state that from the information I have procured, including that obtained from returns annexed to the Railway Commissioners' Report, I find that the cost of land carriage in this district varies from 5 *d.* to 9 ½ *d.* per ton per mile, and the average may be taken at 6 *d.*, whilst the average cost by canals is about 2 ¼ *d.*, and most probably, under an improved system of management, will not exceed 2 *d.* per ton per mile. And thus an amount of benefit proportionate to the greatly increased facility and cheapness of conveyance would be derived from the proposed works.

The exact amount of this benefit, or the amount of profit which the execution of the proposed canal would return, I am not, in the absence of a more detailed survey and inquiry, prepared to state; but I think, that viewing the subject generally, no doubt can be entertained of its remunerative nature, and especially when it is considered as the means of connecting nearly all the inland navigations of Ireland.

(signed) *W. T. Mulvany.*

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* I particularly allude to the great cattle trade which exists between these places.

† I have received returns of the exports and imports of the towns of Boyle, Carrick-on-Shannon, Drumshambo, Ballinamore, and others adjoining the proposed canal, which show a large amount of traffic; and I am happy to add, fully bear out the general opinions I have stated on this subject.

TABLE, showing the Length of the INLAND NAVIGATIONS, and the Names of the Principal Places which would be connected (by a Water communication) by the construction of the proposed JUNCTION CANAL between the Rivers *Shannon* and *Erne*.

Navigations West and South of the proposed Junction Canal.

Name of Navigation.	Names of Principal Places adjoining the Navigation.	Length in Statute Miles.
The Shannon from Limerick to Lough Allen, including the Boyle Water	Drumkeeran Arigna Drumshambo Leitrim Boyle Carrick-on-Shannon Jamestown Drumsna Rooskey Lanesborough Athlone Banagher Portumna Killaloe Limerick	152
Grand Canal and its branches	Ballinasloe Shannon Harbour Ferbane Tullamore Phillipstown Kilbeggan Portarlington Mountmellick Athy Monasterevan Rathangan Naas Dublin	164
The Barrow Navigation, Athy to Waterford	Carlow Leighlinstown New Ross Waterford	78
The Royal Canal	Longford Ballymahon Mullingar Kilcock Maynooth Leixlip Dublin	99
	TOTAL	493

Proposed Junction Canal, 28½ miles long.

Navigations North and East of the proposed Junction Canal

Name of Navigation.	Names of Principal Places adjoining the Navigation.	Length in Statute Miles.
Lough Erne and River Erne	Killeshandra Cavan Belturbet Lisnaskea Enniskillen Kesh Pettigo Belleek	79
The Ulster Canal, including the River Blackwater and Lough Neagh *	Clones Monaghan Middletown Caledon Blackwatertown Charlemont and the Moy Antrim and Ballyronan	76
Tyrone Navigation	Coal Island	12
The Lagan Navigation	Lurgan Moira Lisburn and Belfast	38
The Newry Navigation	Portadown Tanderagee Newry	33
	TOTAL	238

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* Lough Neagh averages about 15 miles long, by 10 miles broad, having a line of coast of 70 miles. The length only from the mouth of the Blackwater to Antrim is included in the mileage above given. A steam-tug vessel is now placed upon the lake to give increased facility and dispatch to the traffic from the Ulster Canal and the shores of Lough Neagh to the ports of Newry and Belfast.

LETTERS from Mr. *Paine* to the Ulster Canal Company, *Francis La Touche*, Esq. and *William Enery*, Esq.

Letters from Mr. Paine to the Ulster Canal Company, &c.
25 June 1845.

Sir, Office of Public Works, 25 June 1845.

I have been directed by the Commissioners appointed under the provisions of the Drainage Act to notify, for your information, and that of other parties who applied under the provisions of that Act for the drainage of flooded lands bordering rivers, lakes, &c. in the districts of Ballinamore and Ballyconnell, in the counties of Leitrim, Cavan, and Fermanagh (including a junction navigation between Lough Erne and the River Shannon), the Commissioners' approval of the matter of such memorial, and of the preliminary Report by John MacMahon, Esq. C.E., who was appointed by them to ascertain the best means to be adopted for effecting the objects referred to, and a copy of his Report is enclosed herewith for your further information.

I am further directed to notify that the Commissioners consider it expedient that the proposed works should be undertaken as a joint measure, and that the whole should form one district, by which, as compared with the separate execution of those referred to in each application, the expense of the drainage works will be considerably reduced.

I have, &c.
(signed) *Henry R. Paine*,
Secretary.

Francis La Tnuche, Esq.
Drumbearney, Carrick-on-Shannon.

A similar letter sent to Mr. Enery, another of the principal proprietors.

Sir, Office of Public Works, 25 June 1845.

I have been directed by the Commissioners appointed under the provisions of the Drainage Act to notify, for the information of the Ulster Canal Company, who applied under the provisions of that Act for the formation of a navigation along the Woodford River and lakes, in conjunction with the drainage of flooded lands bordering these rivers and lakes, &c. in the districts of Ballinamore and Ballyconnell, in the counties of Leitrim, Cavan, and Fermanagh, for the purpose of connecting the Shannon with Lough Erne, and thereby with the Ulster Canal, the Commissioners' approval of the matter of such memorial, and of the preliminary Report of John MacMahon, Esq. C.E., who was appointed by them to ascertain the best means to be adopted for effecting the objects referred to, and a copy of his Report is enclosed herewith for the information of the Ulster Canal Company.

I am further directed to notify that the Commissioners, having received memorials from parties interested in the drainage of the lands along those rivers and lakes, consider it expedient that the proposed works for navigation should be undertaken as a joint measure with those required for drainage, by which, as compared with the separate execution of those referred to in each application, the expense of the navigation works will be considerably reduced.

I have, &c.
(signed) *Henry R. Paine*,
Secretary.

Henry Porter, Esq. Secretary,
Ulster Canal Office.

LETTERS from Mr. *Paine* to the Secretaries to the Grand Jury of *Cavan*, *Fermanagh*, and *Leitrim*.

Letters from Mr. Paine to the Secretaries of the Grand Jury to Cavan, &c.
27 June 1845.

Sir, Office of Public Works, 27 June 1845.

I have been directed by the Commissioners appointed under the Act of 5 & 6 Vict. c. 89, to forward, for the information of the Grand Jury of the county of Cavan, the enclosed copy of a Report which they caused to be made under the provisions of that Act by John MacMahon, Esq. C.E., in consequence of applications made to them by the proprietors of land in the district of Ballinamore and Ballyconnell, injured by floods from the Woodford and Yellow Rivers and their tributaries, in the counties of Cavan, Fermanagh, and Leitrim, to extend to those

those lands the benefits derivable from said Act, and subsequently by an application from the Ulster Canal Company to carry out a line of navigation in conjunction with the drainage referred to, for connecting Lough Erne with the River Shannon at the village of Leitrim; and the Commissioners have, in accordance with the 11th section of the Act, notified to the applicants their approval of the matter contained in the memorials, and of the Report of their engineer, and their opinion that it is expedient the proposed works should be executed; and, with a view to the interests of the applicants, they have recommended combining the drainage and navigation as one measure; and I have at the same time to observe that, by the 60th section of the Act, the counties through which the line of drainage is to be carried are chargeable with the cost attendant on rendering existing bridges, culverts, or archways sufficient for the free passage of flood-water*.

I am, &c.
(signed) *Henry R. Paine*,
Secretary.

The Secretary to the Grand Jury,
County of Cavan.

Letters similar to this were sent to the secretary to the Grand Jury of Fermanagh and to the secretary to the Grand Jury of Leitrim.

LETTERS from Mr. *Paine* to the Secretaries to the Grand Jury of *Roscommon, Londonderry, Armagh, Antrim, Down, Monaghan, King's County, Longford, Tipperary, Galway,* and *Tyrone.*

Letters from Mr. Paine to the Secretaries of the Grand Jury of Roscommon, &c. 28 June 1845.

Sir,
Office of Public Works, 28 June 1845.

The Commissioners appointed under the Act of 5 & 6 Vict. c. 89, having caused a Report to be made to them, under the provisions of that Act, by John MacMahon, Esq. C. E., on the drainage of flooded lands in the districts of Ballinamore and Ballyconnell in conjunction with a line of navigation to connect Lough Erne with the River Shannon at the village of Leitrim, the whole being in the counties of Cavan, Leitrim, and Fermanagh, they have directed me to send the enclosed copy thereof, for the information of the Grand Jury of the county of Roscommon, from which there is reason to hope that the benefits to be derived from the works, in the event of their being executed, may extend to that county.

I am, &c.
(signed) *Henry R. Paine*,
Secretary.

The Secretary to the Grand Jury,
County of Roscommon.

A letter similar to this sent to each of the secretaries to the Grand Juries of Londonderry, Armagh, Antrim, Down, Monaghan, King's County, Longford, Tipperary, Galway, and Tyrone.

CIRCULAR, signed by Mr. *Paine*, to all Proprietors and Persons interested.

Ballinamore, Ballyconnell, and Junction Canal District, Counties of Cavan, Fermanagh, and Leitrim.

Circular, signed by Mr. Paine, to all Proprietors and Persons interested. 28 June 1845.

Sir,
Office of Public Works, 28 June 1845.

As one of the parties reputed to be interested in the proposed drainage of lands and navigation in the above-named district, I am directed to put you in possession of the enclosed copy of a Report on that project, made to the Commissioners appointed under the above Act by John MacMahon, Esq. C. E., and am, at the same time, desired to state that, in accordance with the 11th section thereof, the Commissioners have notified to Francis La Touche, William Enery, and Henry Porter, esquires, who forwarded the memorial in this case, their approval of the matter contained therein, of the Report of their engineer, and their opinion that it is expedient the proposed works shall be undertaken.

I am, &c.
(signed) *Henry R. Paine*, Secretary.

A copy of this circular, with Report, sent to each proprietor or person interested in the district.

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* These impediments are particularly set forth in the Appendix to the Engineer's Report.

DRAINAGE.—BALLINAMORE AND BALLYCONNELL DISTRICT.

COUNTY OF CAVAN.

INDEX TO SCHEDULE, No. 1.

Number of Page in Schedule, No. 1.	PROPRIETORS.	TOWNLANDS.	Quantity of Flooded and Injured Land belonging to each Proprietor.		Present Value.	Estimated Total Annual Increase in the Value and the Proportion in which Lands are to contribute towards the Payment of the Costs of the proposed Works.
			Statute Measure.	Plantation Measure.		
			A. R. P.	A. R. P.	£. s. d.	£. s. d.
1 Agent -	Annesley, Earl - W. A. Moore, esq., Cavan - -	Coologe - - Erraran - - Mullaghan - -	33 3 23	20 3 28	14 15 10	10 – 10
1, 2 & 3 Agent -	Beresford, Lord John, Primate of all Ireland - George L'Estrange, esq., Lisnamander, Crossdowney	Cormeen - - Killaragh - - Bellaheady or - Rossbessal - - Killyran - - Boley - - Derrymore - Derrybeg - - Scrabby - - Prospect - - Townagh - - Doonebeg - -	412 2 17	254 2 35	145 15 10	124 8 1
3 Agent -	Betty, Frederick, esq. - - - John Roycroft, esq., Lisanover, Ballyconnell - -	Kilsob - - Mullaghmore - Lakefield - -	66 0 3	40 3 1	25 11 9	19 11 3
4	Betty, Rev. Wm., 32, Rutland-sq., West - -	Kilsob - - Mullaghmore -	60 2 25	37 1 32	21 3 11	19 8 5
4 & 5 Agent -	Blackford, William, esq. - - - Richard P. Tighe, esq., 20, Middle Gardiner-street, Dublin - -	Drummane - Lisanover - - Corran - - Derrycassan -	98 0 27	59 1 19	25 14 11	27 – –
5 Agent -	Bolton, Linden, esq. - - - James Cowley, esq., 24, Upper Temple-street, Dublin	Coologe - - Burren - -	33 3 12	20 3 21	9 13 9	10 5 5
6 Agent -	Brien, Edw., esq. - Roht. Story, esq., Swanlinbar -	Drumlaydan -	9 2 7	5 3 23	5 3 1	3 13 9
7	Burke, Mrs. Margaret, Bawnboy	Bawnhoy - -	10 3 16	8 2 31	8 6 –	3 12 2
6	Connolly, Rev. Richard and - Thomas Connolly, Ballinamore -	Kildongh - -	20 3 32	12 3 30	9 1 1	7 2 4
7	Coughran, Thos. esq., Ballyconnell.	Gortullaghan -	3 0 35	1 3 38	2 7 8	1 1 11
7 Agent -	Davis, Rev. John, St. John's, Warrenpoint - - John Patterson, esq., Lisnaskea -	Kilmoriarty -	11 3 8	7 1 4	1 5 4	2 – –
	Carried forward - - - -		759 2 3	468 3 22	268 19 2	228 4 2

Number of Page in Schedule, No. 1.	PROPRIETORS.	TOWNLANDS.	Quantity of Flooded and Injured Land belonging to each Proprietor.						Present Value.			Estimated Total Am Increase in the Va and the Proport in which Lands are to contribute towards the Payment of the Cost of the proposed Works.		
			Statute Measure.			Plantation Measure.								
			A.	R.	P.	A.	R.	P.	£.	s.	d.	£.	s.	d.
	Brought forward - - - - -		759	2	3	468	3	22	268	19	2	228	4	2
7 Agent -	Dobbin, Leonard, esq., 27, Gardiner's-place, Dublin Henry L. Prentice, esq., Caledon -	Kilnavert - - Port - - -	92	2	10	57	0	23	38	17	1	32	1	8
7	Dolan, Mr. James, Drumlougher, Bawnboy.	Drumlougher -	2	2	0	1	2	7	1	10	10	-	16	6
7	Dolan, Mr. Michael, Drumlougher, Bawnhoy.	- - ditto - -	1	3	7	1	0	17	1	2	1	-	11	1
7 Agent -	Elliott, Mrs., Cavan Henry Cooper, esq., Belturbet - -	Tirnawannagh -	17	0	19	10	2	11	5	5	8	4	4	6
8 Agent -	Ellis, Rev. Arthur, Kildimock Glebe John Roycroft, esq., Ardee, Lisanover, Ballyconnell -	Ballymagauran - Gortaclogher -	95	3	14	59	0	27	40	18	8	27	1	1
8, 9, 10, 11 Agent -	Enery, Wm. esq., Ballyconnell - John Haverfield, esq. - - -	Mullanacre, Lower Carrowmore - Derryginny - Lecharrownahone Agharaskilly - Cullyleenan - Annagh - - Down - - Corraneirna - Rakeelan - - Scotchtown, or - Gortawee - - Corraguil - - Cullaghan - - Mullaghduff - Crossmakeelagher	498	1	25	307	2	30	185	14	3	166	13	8
12 Agent -	Faucett, Edward, esq. - - - Charles Gerrard, esq., Bush-hill, Ballinamore -	Senhagh - -	18	0	10	11	0	24	6	13	9	6	13	9
12	Finlay, Geo., esq., Coville, Bawnboy	Corr - - - Moneymore -	43	0	31	26	2	26	22	–	8	14	9	9
12	Finlay, John, esq., Brackley, Bawnboy.	Brackley - -	6	0	25	3	3	8	2	7	10	1	19	4
12 & 13 Agent -	Finlay, Sir Thos. - James Cowley, esq., 24, Upper Temple-street, Dublin	Arderry - - Teehoy - -	38	2	26	23	3	10	13	8	6	11	1	9
13 Agent -	Grattan, H., esq., M. P. - - D. J. Shea, esq., 66, Camden-st., Dublin - -	Toherlyan - - Toherlyanduffin -	32	0	31	19	3	20	10	11	–	9	19	5
14	Gumley, John, esq., Belturhet.	Cloneary - -	46	1	33	28	2	29	17	11	10	14	19	-
	Carried forward - - - -		1,652	1	34	1,020	0	13	815	1	4	518	14	8

Number of Page in Schedule, No. 1.	PROPRIETORS.	TOWNLANDS.	Quantity of Flooded and Injured Land belonging to each Proprietor.						Present Value.			Estimated Total Annual Increase in the Value and the Proportion in which Lands are to contribute towards the Payment of the Costs of the proposed Works.		
			Statute Measure.			Plantation Measure.								
			A.	R.	P.	A.	R.	P.	£.	s.	d.	£.	s.	d.
	Brought forward - - - - -		1,652	1	34	1,020	0	13	615	1	4	518	14	8
14	Haran, Mr. Hugh, Drumlougher, Bawnboy.	Drumlougher -	25	3	20	15	3	36	8	10	9	7	18	7
14 Agent -	Hassard, Richard, esq., Bawnboy - Richard Bracken, esq., Black Lion, Enniskillen -	Gowlagh, South, Bawnboy - - Cloncurkney - Derrymoney -	106	0	8	85	1	35	50	11	5	36	14	1
15 Agent -	Irwin, Wm., esq. - John Friars, esq., 8, Henrietta-street, Dublin - -	Kilcorboy - - Drungart - - Mullanwary - Lagan - -	41	0	2	25	1	11	28	11	3	14	-	8
15	Johnston, Mr. Alexander, Ballymagirrill, Bawnboy.	Ballymagirrill -	4	2	8	2	3	9	2	9	1	1	15	1
15	Lananze, Rev. Thomas, Corboy Glebe, Bawnboy.	Corboy (Glebe) -	26	0	22	16	0	22	8	1	4	9	13	8
15 Agent -	L'Estrange, Genl - George L'Estrange, Lesnamander, Crossdowney -	Owengallees -	42	2	15	20	1	7	19	14	5	14	9	2
16	Mansfield, John, esq., Mountmellick.	Gortullaghan -	7	3	20	4	3	18	4	11	1	2	8	10
16	Morgan, —— -	Gortullaghan -	2	0	30	1	1	16	1	12	5	-	14	10
16	Murray, Mrs. Anne	Gortullaghan -	3	1	35	2	0	23	2	11	5	1	3	7
16	Neil, Mr. George, Kilcorly, Ballyconnell.	Kilcorhoy - -	2	2	20	1	2	19	1	18	10	-	12	11
16	Pollock, Mr. Wm., Ballenagh, Cavan.	Gortulaghan -	6	1	26	3	3	33	4	14	11	2	3	6
16	Rutledge, Mr. Edward, Ballymagirrill, Bawnboy.	Ballymagirrill -	2	3	0	1	2	32	1	9	9	1	1	2
	Rutledge, Mr. Foster, Ballymagirrill, Bawnboy.	Ballymagirrill -	10	0	10	6	0	34	5	8	8	3	17	8
16 & 17	Slack, Arthur R. esq. - - -	Cornagunleog - Stranadarragh -	56	3	8	35	0	11	29	6	10	20	11	9
17	Slack, Thomas R., esq. - - -	Ballymagauran - Killywillin -	81	0	9	50	0	6	36	9	8	28	2	3
18 Agent -	Sneyd, —— - G. M. Knipe, esq., Erne Hill, Belturbet - - -	Corrasmonger - Mumagban - Erraran - - Derrymoney - Killineary - -	102	3	10	63	1	35	32	18	6	27	6	2
18	Story, James H. esq., Killyshandra.	Killywilly - -	3	0	5	1	3	19	-	13	8	-	13	5
18 & 10	Thornton, Perrot, esq., Greeville, Ardlogher - -	Ray - - - Callagh - - Killynaskellan -	54	1	21	33	2	12	14	18	10	16	-	9
19	Veitch, Mr. James	Ballymaganran -	12	3	20	7	3	32	6	19	-	4	19	5
10	White, Thomas Jervis, esq., 4, Lower Gloucester-street, Dublin.	Bellaleena - -	22	3	39	14	0	31	12	1	5	8	10	7
	TOTAL of this District in the County of Cavan - - -		2,258	0	2	1,400	0	24	886	9	2	721	7	9

COUNTY OF FERMANAGH.

Number of Page in Schedule, No. 1.	PROPRIETORS.	TOWNLANDS.	Quantity of Flooded and Injured Land belonging to each Proprietor. Statute Measure.	Quantity of Flooded and Injured Land belonging to each Proprietor. Plantation Measure.	Present Value.	Estimated Total Annual Increase in the Value and the Proportion in which Lands are to contribute towards the Payment of the Costs of the proposed Works.
			A. R. P.	A. R. P.	£. s. d.	£. s. d.
20	Collins, Robt. esq., M.D., 2, Merrion-square, North, Dublin - -	Ummera - - Agbandisert - Garrary - - Derrintorey - Derryart - -	115 2 29	71 1 23	43 10 6	38 14 5
21	Dunn, Josias, esq. 8, Kildare-street, Dublin - -	Drumony More -	24 0 16	14 3 21	9 17 3	8 13 7
21 & 22	Enery, Wm., esq. Ballyconnell -	Knockadoois - Gortineddan - Carrickaleese - Cloncoohy - -	102 2 11	63 1 11	40 8 11	35 16 5
23, 24 & 25	Erne, Earl of, Crun Castle, Lisnaskea	Drumlught - Drumderg - Kiltycrose - Dernagore - Derryhorley - Darrylaney - Mullan - - Kinoughtragh - Teemore - - Drumsbimuck - Corry - - Drummettagh - Toneymore - Killycrampb - Aghalane - -	278 1 8	108 2 35	119 3 5	89 17 10
26	Fox, Rev. John James, Knawley Glebe, Derrylin, Ballyconnell -	Culleen - - Corratrasna -	50 1 39	81 0 28	19 17 8	15 2 1
	Total of this District in the County of Fermanagh -	- - -	566 0 23	349 2 1	232 15 4	188 4 4

COUNTY OF LEITRIM.

	Allerton, Mr. Geo., Kilnacreevy, Ballinamore - -	Kilnacreevy -	8 2 2	5 1 1	8 13 7	3 8 1
Agent -	Barber, Robt. E., esq., Rathmore, Ballymabon - Wm. Lawder, esq., Mougb Fanagb -	Drumlaheen - Derrymacoffin -	42 1 25	28 0 29	12 3 8	12 3 6
	Barkin, Wm. H., esq., 21, Mary-st. Dublin - -	Tullylaman -	4 1 38	2 3 3	1 13 2	1 13 3
	Beggs, Mr. Wm., Drumreilly, Ballinamore - -	Drumreilly -	1 3 0	1 0 13	– 13 –	– 13 -
	Beresford, Rev. G. D. La Poer, Glebe, Feenagh - -	Drumraine (Glebe)	39 1 20	24 1 9	14 11 8	12 3 1
		Carried forward - - -	98 2 5	59 2 15	32 14 11	20 15 11

Number of Page in Schedule, No. 1.	PROPRIETORS.	TOWNLANDS.	Quantity of Flooded and Injured Land belonging to each Proprietor.						Present Value.			Estimated Total Annual Increase in the Value and the Proportion in which Lands are to contribute towards the Payment of the Costs of the proposed Works.		
			Statute Measure.			Plantation Measure.								
			A.	R.	P.	A.	R.	P.	£.	s.	d.	£.	s.	d.
	Brought forward - - - - -		96	2	5	59	2	15	32	14	11	20	15	11
 Agent -	Besborough, Earl of, Cavendish-sq., London - - J. Blackett, esq., Belline, Piltown	Corrachoosaun - Drumroosk, North Braura - - Derrinkip - - Drumtillin - - Muckross - - Corrabeagh - - Drumruckill -	116	3	15	70	1	5	65	12	9	28	10	9
	Blakely, Mr. John, Drumreilly, Ballinamore - -	Drumreilly - -	1	0	20	0	2	31	–	8	4	–	6	10
 Agent -	Clements, Representatives of Colonel - John Boyd, esq., Coote-hill - -	Liscuilfea - - Callow-hill - -	98	3	5	60	3	37	41	2	5	29	19	4
	Collins, Rob., esq., M.D., 2, Merrion-square, North -	Aghoo, East - Coryloghan - Aghoo - - Aghoo, West -	77	1	15	47	3	0	31	12	6	24	16	8
	Duignan, Mr. G., Derrygoan, Ballinamore - -	Derrygoan - -	2	2	19	1	2	19	–	13	9	–	13	9
	Faris, Miss Anne, Corramahon, Ballinamore - -	Corramahon -	2	3	0	1	2	32	1	14	–	1	1	3
	Goodfellow, John, esq., Shannon Lodge, Leitrim, Carrick-on-Shannon - - -	Tully Auman -	10	0	4	6	0	30	4	11	2	3	14	3
	Gore, Robert, esq., Woodford, Ballinamore - -	Woodford Demesne - - Derryniggan - Kilnacreevy -	90	3	13	56	0	13	26	4	–	24	12	1
 Agent -	Gore, Wm. Ormsby, esq. - - - Wm. Dee, esq., 65, Gardiner-place, Dublin - -	Longstones - - Kiltygerry - -	53	2	6	36	0	22	14	7	7	16	14	3
	Harrison, Mr. Wm., Drumreilly, Ballinamore.	Drumreilly - -	5	2	0	3	1	23	1	7	2	1	7	2
	Hudson, Rev. Alexander, Glebe, Ballinamore.	Drumdartan -	2	0	30	1	1	16	1	4	3	–	5	5
 Agent -	Jones, Mr. - - George L'Estrange, esq., Lisnamander Crossdowney -	Killymoodan - Cornacreegh - Sradrinan - - Leekan - - Stroke - - Sraloughan - Kiltyhugh - - Fohera - - Tully - - - Stradermot - - Castlerogy - -	277	3	35	171	2	16	116	17	2	89	11	1
	Jones, Michael, esq., Cregg House, Sligo - -	Corrabeegher - Drumbibe - -	53	2	16	33	0	16	22	9	9	15	3	10
	Carried forward - - - -		691	2	25	550	1	35	330	10	9	266	13	–

Number of Page in Schedule, No. 1.	PROPRIETORS.	TOWNLANDS.	Quantity of Flooded and Injured Land belonging to each Proprietor.						Present Value.			Estimated Total Annual Increase in the Value and the Proportion in which Lands are to contribute towards the Payment of the Costs of the proposed Works.		
			Statute Measure.			Plantation Measure.								
			A.	R.	P.	A.	R.	P.	£.	s.	d.	£.	s.	d.
	Brought forward - - - -		891	2	25	550	1	35	330	19	9	266	13	-
	King, Rev. Henry, Balilin, Ferbane -	Kilclarabeg - Corragolly - Drumlittenking -	25	2	27	15	3	15	8	0	10	6	14	3
	Keon, Ferdinand, esq., Keon Brook, Keshearrigan -	Newbrooke - Drumduff - -	9	0	38	5	2	32	4	11	2	2	17	4
Agent -	Lanange, Rev. Thomas, Templeport Glebe, Bawnboy - Foster Rutledge, esq., Ballymagirrill, Bawnboy -	Glebe - - Knocks Glebe -	57	3	10	35	2	30	3	15	4	2	18	11
Agent -	Latouche, Peter D., esq., Bank, Castle-street - - Francis Latouche, esq., Drumhearney, Carrick-on-Shannon - - -	Leitrim - - Sheffield - - Ballynawing - Tirmacteirnan - Killaneen - - Tomloskan - - Kiltybarden - Drumkeen - - Drumany - - Mober - - Mayo - - Ardrum - - Edentinny - - Agbadark - - Tullyoscar - - Drumbad - - Creevy - -	559	0	4	345	0	18	231	11	5	177	10	8
	Laurence, Mr. Richard, Corramahan, Ballinamore.	Corramahan -	0	1	20	0	0	37	-	4	8	-	2	10
	Lawder, H. N., esq, Kilmore, Roscommon.	Scrabbagh - -	10	3	12	6	2	30	2	13	6	2	13	6
	Lawder, John, esq., Mough, Feenagh.	Mough - -	4	3	25	3	0	5	-	15	2	1	1	2
Agent -	Leitrim, Earl of - —— Mayne, esq., Newbliss - -	Kilnacreevy - Newtown Gore -	43	1	29	26	3	10	13	7	6	10	7	10
	Maguire, Alexander, esq.	Lissacarn - -	18	1	0	11	1	3	9	11	7	7	6	6
	M'Cabe, Mr. James	Carrick - -	1	2	20	1	0	1	-	15	1	-	12	1
	M'Namara, Rich. esq., Letterfine, Keshcarrigan -	Loughscur - - Seltan M'Donald Roscarban - - Letterfine - - Gooly - - Keschcarrigan -	128	2	15	79	1	22	43	-	3	39	4	4
Agent -	Moffat, Rev. Robt. J., Larch Hill, Naas - - James Speer, esq., Frisk Hill, Granard - - -	Leitrim - -	6	2	7	4	0	6	4	13	11	2	18	-
	Molloy, Rev. Coote, Hautaville, Guernsey - - -	Killarcan - -	44	2	9	27	2	1	19	7	9	16	11	5
	Carried forward - - - -		1,802	2	1	1,112	3	5	673	13	11	537	12	4

Number of Page in Schedule, No. 1.	PROPRIETORS.	TOWNLANDS.	Quantity of Flooded and Injured Land belonging to each Proprietor.						Present Value.			Estimated Total Annual Increase in the Value and the Proportion in which Lands are to contribute towards the Payment of the Costs of the proposed Works.		
			Statute Measure.			Plantation Measure.								
			A.	R.	P.	A.	R.	P.	£.	s.	d.	£.	s.	d.
	Brought forward		1,802	2	1	1,112	3	5	373	13	11	637	12	4
	Moreton Johnston, esq., Carrick-on-Shannon	Lisconnor	2	2	36	1	2	28	1	3	5	–	11	8
	Neil, Mr. Samuel, Kilnacreevy, Ballinamore	Kilnacreevy	22	3	20	14	0	19	7	1	2	7	15	3
	O'Brien, Acheson, esq., Drumsillagh, Carrigallen	Derrinkeher McDonald Oughteragh Unshinagh Cromlin Derrinasmallan	141	2	19	87	1	20	47	5	9	39	7	–
	O'Brien, William Lloyd, esq., Boyle	Aghacashlaun Drumgud	38	3	34	20	3	34	6	17	11	4	1	2
	O'Kelly, Rich. esq.	Drumaleague	15	1	30	9	2	4	3	6	8	3	6	8
	Parsons, Mr. Wm. Corramahan, Ballinamore	Corramahan	0	3	25	0	2	10	–	11	3	–	7	–
Agent -	Percival Westby, esq. Alex. Walsh, esq., Aghavilla, Carrigallen	Drunconra Derrygoan Cuilmore Carrickmakeegan	133	2	39	82	2	11	46	13	7	43	9	6
	Percy, Alexander, esq., Welbyfield, Ballinamore	Killadough Killaglasheen	62	2	35	32	2	7	13	14	3	15	4	3
Agent -	Percy, W. Charges, esq., Garradice, Ballinamore William Shanley, esq., Kilrush, Ballinamore	Gerardice Bush Hill Drumlonan Kilrush Aghyowla Lisnatullagh Curraghashillaun Kilnacreevy Drumreilly Cannaboe Lahard Kildorragh Knockanroe Dromore	275	1	10	169	3	34	106	15	4	99	2	1
	Percy, Wm. Geo. esq., Killafort, Ballinamore	Lisnatullagh	77	1	0	47	2	30	34	8	2	29	5	3
	Percy, Rev. Wm. Drumliffen glebe, Carrick-on-Shannon	Ardmenan	31	1	35	19	1	28	12	12	6	9	14	3
	Peyton, Geo. esq., Dring House, Keshcarrigan	Rossy Dring	173	0	9	106	3	14	24	–	3	32	–	3
	Peyton, John H. esq., Port, Carrick-on-Shannon	Ballygart Carrickaverill	10	3	17	6	2	32	4	10	10	3	19	6
	Peyton, John R. esq., Laheen, Keshcarrigan	Laheen Clooney	20	0	3	12	1	13	4	4	11	3	9	–
	Peyton, Wm. esq., Keshcarrigan	Armagh	73	3	33	46	2	27	22	4	6	11	5	3
	Carried forward		2,868	1	28	1,770	3	10	1,012	4	9	840	10	10

Number of Page in Schedule, No. 1.	PROPRIETORS.	TOWNLANDS.	Quantity of Flooded and Injured Land belonging to each Proprietor.						Present Value.			Estimated Total Annual Increase in the Value and the Proportion in which Lands are to contribute towards the Payment of the Costs of the proposed Works.		
			Statute Measure.			Plantation Measure.								
			A.	R.	P.	A.	R.	P.	£.	s.	d.	£.	s.	d.
	Brought forward - - - - -		2,863	1	28	1,770	3	10	1,012	4	9	840	10	10
	Ponsonby, John, esq. - - -	Corrahort - - Drumcarra -	10	0	2	6	0	29	4	11	11	2	14	10
	Shanly, Mrs. Matilda, Riversdale, Ballinamore -	Corrachole, or Riversdale - -	21	3	6	13	1	31	14	15	9	7	7	10
	Slack, James Wm. esq., Annadale, Drumshambo -	Drumhubrid - Kiltabrid - - Corglass - - Leitrim - -	115	3	0	71	1	33	16	11	7	19	10	3
	Slack, Launcelot, esq., Carrick-on-Shannon.	Drumeong - -	11	0	0	6	3	7	3	7	11	2	14	4
Agent -	Southwell, The Viscount, Henlip Castle, Worcestershire - - - Gerald Walsh, esq., Drumona - -	Loughconway - Drumbullog - Oughnahoo - Corderry - -	27	0	24	16	3	2	11	16	7	8	0	2
	Taylor, George, esq., Clover Hill, Ballinamore -	Corglass or Clover Hill, - - Camagh - -	19	1	30	12	0	0	10	6	6	7	13	5
	Vaugh, George, esq., Leitrim, Carrick-on-Shannon.	Ballanaboy - -	6	2	28	4	0	19	2	13	6	2	7	3
	Vaugh, George and James, esqs., Leitrim, Carrick-on-Shannon.	Tullylannan -	7	2	0	4	2	21	3	-	2	2	15	7
	Vaugh, John, esq., Leitrim, Carrick-on-Shannon.	Ballanaboy - -	4	1	22	2	2	33	2	3	4	1	12	4
	Walsh, Gerald, esq., Drumona - -	Gubroe - - Kilmascherwell - Boneill - - Kiltyfirman - Leamanish - - Drummany O'Brien Drummany Tenants	264	2	39	163	1	30	32	14	2	74	7	7
	Whitlow, William, esq., Clones -	Seltan Moran - Kilclaramore -	21	0	36	13	0	16	6	11	10	5	19	7
	Walker, Rev. Wm., Corduff, Ballinamore - - -	Aghawellin - Glebe - -	41	2	22	26	2	33	12	12	3	11	18	0
	TOTAL of this District in the County of Leitrim - -		3,419	2	36	2,111	0	24	1,182	10	3	987	12	-

RECAPITULATION.

COUNTY OF CAVAN - - - - - -	2,268	3	2	1,400	0	24	386	9	2	721	7	9
Ditto FERMANAGH - - - - -	686	8	23	349	2	1	232	16	4	188	4	4
Ditto LEITRIM - - - - - -	3,419	2	36	2,111	0	24	1,182	10	3	087	12	-
TOTAL of the District - - -	6,253	3	21	3,860	3	9	2,301	14	9	1,897	4	1

RETURN of Sums Paid on Account of the Commissioners appointed under the Act 2 & 3 V'ct. c. 61, for the Improvement of the River *Shannon*.

COMMISSION.

AMOUNTS and Periods of Payment for Salaries and Expenses of the Commission under the Act 2 & 3 Vict. c. 61, from what Quarter Issued, and whether by Grants or Loans.

YEARS.	SALARIES.	Travelling and Contingent Expenses.	TOTAL.	Grant or Loan.	From what Quarter Issued.
	£. s. d.	£. s. d.	£. s. d.		
1839 - - -	525 18 4	104 5 11	630 4 3	Grant -	By the Lords of the Treasury.
1840 - - -	1,942 3 –	916 11 10½	2,658 19 10½	ditto -	
1841 - - -	2,150 5 5	766 15 3½	2,939 – 8½	ditto -	
1842 - - -	2,009 15 6	443 – –½	2,452 15 6½	ditto -	
1843 - - -	2,177 6 9	642 6 6	2,619 13 3	ditto -	
1844 - - -	2,092 17 5	504 11 7½	2,597 9 –½	ditto -	
1845, up to 15 June	963 16 8	289 15 3	1,253 11 11	ditto -	
Totals - - £.	11,662 8 1	3,669 6 6	15,551 14 7	—	—

ESTIMATE of the Salaries and Expenses of the Commission for the Year ending 31 March 1646.

	£. s. d.
Salaries - - - - - - - - - - -	2,107 2 –
Travelling, contingent, and law expenses - - - - - -	490 – –
£.	2,597 2 –

WORKS.

AMOUNTS and Periods of Payments for Works under the Act 2 & 3 Vict. c. 61, from what Quarter Issued, and whether by Grants or Loans.

YEAR.	GRANT.	LOAN.	TOTAL.	From what Quarter Issued.
	£. s. d.	£. s. d.	£. s. d.	
1839 - - -	67 9 2	87 9 2	174 16 4	Proceeds of Exchequer Bills issued under the provisions of the 4th section of the Act 2 & 3 Vict. c. 61.
1840 - - -	43,813 16 7¾	43,813 10 8	87,627 13 3¾	
1841 - - -	27,321 4 3¼	27,321 4 3¼	54,642 6 6½	
1842 - - -	39,482 – 7¾	39,482 – 7¾	78,964 1 3½	
1843 - - -	36,803 7 1¼	36,603 7 1¼	73,606 14 2½	
1844 - - -	32,243 7 5¾	32,243 7 5¾	64,486 14 11½	Ditto, and issues of cash by the Lords of the Treasury.
1845, up to 15 June	14,225 7 6½	14,225 7 8½	28,450 15 5	
Totals - - £.	193,976 13 –¼	193,976 13 –½	387,953 6 –¾	
1841(a) - -	1,233 13 6	- - - -	2,233 15 7½	By the Lords of the Treasury.
1842(b) - -	1,000 2 1½			

(a) This item is the expenditure incurred in holding courts of valuation at the principal places along the Shannon to confirm and pay awards, and expenses connected therewith.

(b) Expense of preparing and lodging the maps of the boundary of jurisdiction of the River Shannon, in conformity with the 39th and 40th sections of the Act 2 & 3 Vict. c. 61.

AMOUNT, whether by Grant or Loan, that the Treasury have still power to Advance for Works under the Act 2 & 3 Vict. c. 61.

GRANT.	LOAN.	TOTAL.
£. s. d.	£. s. d.	£. s. d.
85,467 – –	88,840 – –	174,307 – –

H. Mason, Accountant.

633.

LOUGH ERNE AND SHANNON.——SHANNON NAVIGATION.

MAPS AND PLANS

Referred to in the REPORT of *John MacMahon*, Esq. C. E., on the *Ballinamore* and *Ballyconnell* Drainage, and on the Formation of a Line of Navigation in connexion therewith from Lough *Erne*, in the Counties of *Cavan* and *Fermanagh*, to the River *Shannon* at *Leitrim*.

[*Vide* LIST of PLANS at page 8 of Parliamentary Printed Paper, No. 633, already delivered.]

Ordered, by The House of Commons, *to be Printed,*
8 *August* 1845.

[*Price* 2*s*.]

633—(*continued*).